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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Practical Results of Bacteriological Researches. By GEORGE M. STERNBERG, M.D.	1
Local Anæsthesia as a Guide in the Diagnosis of Lesions of the Lower Spinal Cord. By M. ALLEN STARR, M.D., PH.D.	15
Radical Cure of Psoas Abscess. By R. W. MURRAY, F.R.C.S. ENG.	35
Ganglion and Teno-vaginitis Tuberculosis. By CHARLES SETH EVANS, B.S., M.D.	38
Lead-poisoning with Special Reference to the Spinal Cord and Peripheral Nerve Lesions. By EDWARD D. FISHER, M.D.	51
Immunity from Phthisis as Affected by Altitude in Colorado. By C. F. GAR- DINER, M.D.	55
Metal-turners' Paralysis. By G. L. WALTON, M.D., and C. F. CARTER, M.D.	61
Three Cases of Traumatic Hysterical Paralysis of Twenty-nine, Twenty-eight, and Twenty-nine Years' Duration Respectively in Males. A Contribution to the Prognosis in Traumatic Neuroses. By MORTON PRINCE, M.D.	62

REVIEWS.

A System of Practical Therapeutics. Edited by Hobart Amory Hare, M.D., assisted by Walter Chrystie, M.D.	67
The Practitioner's Handbook of Diseases of the Ear and Affections of the Nose and Naso-pharynx. By H. MacN. Jones, M.D., and W. R. H. Stewart, F.R.C.S.	69
Chronic Insanity of Systematic Development. By V. Magnan	71
The Principles of Bacteriology. By A. C. Abbott, M.D.	73
Handbook of Diseases of the Eye and their Treatment. By H. R. Swanzy, M.B.	73
The Pocket Pharmacy, with Therapeutic Index. By John Aulde, M.D.	74
A Guide to Therapeutics. By Robert Farquharson, M.P., M.D. Edin.	74
Coca and Cocaine. By William Martindale, F.C.S.	74
The Pathology and Treatment of Hip-joint Disease. By Robt. W. Lovett, M.D.	75
A Dictionary of Treatment, or Therapeutic Index. By William Whitla, M.D.	77
Stricture of the Rectum. By Charles B. Kelsey, M.D.	78

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Thiophen	79	Treatment of Bone and Joint Tuber-	
Salipyrine	79	culosis by Iodoform-oil	84
Treatment of Chronic Gastric Affections	80	Treatment of Simple Pleurisy . .	84
Digestive Ferment in Anagallis Arvensis	81	Treatment of Pneumonia by Digitalis	84
Treatment of Enteric Fever	81	Treatment of Diphtheria	84
Typhoid Fever Treated with Fel Bovis	82	Treatment of Diabetes	85
Treatment of Infantile Diarrhœa . .	82	Use of Digitalis in Aortic Disease .	86
Action of Abdominal Massage . . .	83	Ergotinine	86
Creasote and its Elements	83	Quinine Rash Produced by Small Doses	86
Treatment of Pulmonary Tuberculosis	83	Dye-treatment of Malignant Neoplasm	87

MEDICINE.

	PAGE		PAGE
Enlargement of Spleen in Children	87	Enteric Fever Complicated by Suppu-	
Renal Dropsy	89	rative Epididymitis	92

SURGERY.

Gunshot Wound of the Abdomen	93	Catheterization of the Biliary Ducts	98
The Topical Treatment of Cystitis	94	Gunshot-wounds of the Spinal Column	98
Retro-pharyngeal Abscess in Infancy	95	Compound Fracture of the Skull and	
Dermoids of the Abdominal Wall	95	Wound of the Arm Centre	99
The Schwabe Treatment of Hernia	96	Intestinal Occlusion by Torsion of the	
Treatment of Intra-mammary Abscess	96	Large Bowel; Laparotomy	100
Tubercular Disease of Shoulder-joint	96	Removal of a Calculus from the Ver-	
The Enuclation of Goitre	97	miform Appendix	101

OTOLOGY.

Impacted Cerumen in Mastoid Process	101	Chronic Purulent Otitis Media	106
Nystagmus in Aural Affections	102	Acute Otitis Media after Measles	106
Relief of Impaired Hearing	102	Hemorrhages into the Labyrinth	108
Opening of the Mastoid	103	Osseous New-growth in Membrana	108
Abscess of the Temporal Lobe	104	Inflammation of the Middle Ear	109
On the Function of the Cochlea	106	Effects of the Telephone on Hearing	110

OBSTETRICS.

A Successful Cæsarean Section	111	Death from Retroflexed and Incar-	
Uterine Mole Complicated by Hemor-		cerated Uterus	112
rhage, Terminating in Recovery	111	A Tubal Abortion	112
The Treatment of Uterine Mole	112	Puerperal Tetanus	113

GYNECOLOGY.

Pneumococci in Pus from a Pyosalpinx	114	The Influence of Peritonitic Adhe-	
Strangulated Hernia of the Ovary	114	sions on Parturition	117
Secondary Carcinoma of Uterine Body	115	Chancre of the Cervix Uteri Mistaken	
The Causes of Recurrence after the		for Epithelioma	118
Removal of Cancer	115	Vaginal Hysterectomy for Carcinoma	118
Carcinoma Uteri with Fibro-myoma	116	Endothelioma of the Ovary	119
A Rare Form of Fibro-cyst of Uterus	116	Lipoma and Fibroma of Fallopian Tube	119
Pregnancy and Ventro-fixation	117	Endometritis in Acute General Diseases	119
Treatment of Carcinoma Uteri	117	Streptococcus Infection of Vermiform	
Influence of Pelvic Diseases on Voice	117	Appendix and Fallopian Tube	119

PÆDIATRICS.

Retro-pharyngeal Lymphadenitis	120	The Etiology of Aphthous Stomatitis	123
Mammary Abscess in Newborn Infant	120	Acute Nephritis Following Eczema	123
Osteo-arthropathic Pneumonie of		The So-called Fever of Growth	123
Marie	121	Microorganisms in the Healing Um-	
Systolic Bruit of the Fontanelle	122	bilical Cord	124

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JULY, 1892.

PRACTICAL RESULTS OF BACTERIOLOGICAL RESEARCHES.¹

BY GEORGE M. STERNBERG, M.D.,
LIEUT.-COL. AND SURGEON, U. S. A.

SCIENCE does not demand practical results, but investigates for the purpose of establishing facts and explaining phenomena; and bacteriology as a branch of natural history is entitled to equal consideration with other departments of scientific research. Indeed, the low organisms known as bacteria offer many advantages for the study of fundamental biological problems; and the researches already made have borne abundant fruit from a scientific point of view.

But Medicine is eminently practical in its aims, and practising physicians, as well as intelligent laymen, are apt to meet every announcement of a new discovery in pathology with the question: "Does it aid in the cure of disease?" Heretofore the bacteriologist has been compelled to admit that the demonstration of the specific cause in a considerable number of infectious diseases, which has been obtained through his researches, has not resulted in the discovery of a specific treatment for these diseases. At the present moment we are in possession of experimental data which open up to us a vista of possibilities in specific treatment unsuspected a year or two ago. We shall presently give a somewhat detailed account of the experimental data referred to, and will indulge in some speculation as to the practical results which are likely to follow this remarkable addition to our knowledge.

The title of my paper calls also for some reference to practical results of another kind, viz., in the prevention of disease.

¹ Read before the Association of American Physicians, at Washington, May 24, 1892.
VOL. 104, NO. 1.—JULY, 1892.

Without doubt, preventive medicine—or “sanitary science,” as it is sometimes called—has been immensely benefited by the researches of bacteriologists. It is true that sanitarians had obtained, by observation and empirical methods, important data upon which to found their recommendations before we had any knowledge of pathogenic bacteria. But it is also true that in the absence of this knowledge their recommendations were often inadequate and contradictory, and were without the authority which comes from an exact experimental basis.

In practical disinfection, for example, agents were often employed which have since been shown to have but little value, or agents of value were employed in inadequate amounts. Again, in the absence of any precise knowledge of the nature of the infectious agent, or of its special habitat, the sanitarian often devoted himself to the destruction of imaginary germs in the air, and failed to attack pathogenic bacteria in the sputa of patients with pulmonary tuberculosis and in the excreta of those with typhoid fever.

To-day we have an exact knowledge of the usual habitat and of the biological characters of a considerable list of pathogenic bacteria; and this knowledge enables us to formulate recommendations which, if carried out, would doubtless go far toward eradicating the diseases induced in man, and in the lower animals, by these infecting agents. For example, the demonstration that tuberculosis is an infectious disease due to a bacterial parasite—the bacillus tuberculosis—at once leads to the recommendation that this bacillus be destroyed wherever it may be found external to the bodies of infected individuals. The fact that it is present in the sputa of patients suffering from pulmonary tuberculosis, in the milk of tuberculous cows, and in the tissues of tuberculous animals, leads to the more specific recommendations that the sputa of tuberculous patients should be disinfected; that cow's milk from an unknown source should be sterilized before it is used as food; and that the flesh of tuberculous animals should not be used as food. Finally, our knowledge of the action of numerous disinfecting agents, as tested upon this bacillus, enables us to give specific directions as to its destruction; and, as we have experimental evidence showing that the tubercle bacillus is quickly destroyed by the boiling temperature, we may permit the use of milk from an unknown source after it has been boiled.

Again, we may point to the present position of aseptic surgery and midwifery. In the absence of precise knowledge relating to the microorganisms concerned in traumatic infections, Lister devised his spray apparatus for destroying pyogenic bacteria in the air during an operation. We know now, as the result of carefully conducted experiments, that this was an unnecessary precaution, and that it would not have been efficient if the microorganisms to be destroyed had been present in the air in considerable numbers, as was imagined by the illustrious originator

of antiseptic surgery. And, having learned that the great danger of infection results from the transfer of pathogenic bacteria to wound surfaces by the hands or instruments of the surgeon or his assistants; that pyogenic bacteria are found on the surface of the body and of the mucous membranes in healthy persons; and that sterilization of the hands of the surgeon or of the surface through which his incisions are to be made can be effected by certain procedures, which have been elaborated by the experimental method, aseptic surgery takes its place as a rational method founded upon scientific observations. Thus prevention of infection becomes the first duty of the surgeon and of the obstetrician, as well as of the physician and sanitary official. And the necessity for treating infected wounds, puerperal septicæmia, or local epidemics of infectious diseases, in the light of our present knowledge, is a reproach which attaches to some individual or corporation.

But scientific men are so familiar with the practical results of bacteriological studies, so far as preventive medicine is concerned, that it is unnecessary to insist upon this point. Nor need I do more than advert to the considerable success attending the use of antiseptics in traumatic infections, and in localized infectious processes, when these are accessible to local treatment.

Among the practical results of bacteriological researches we may mention the early diagnosis of certain infectious diseases by methods which serve to demonstrate the presence of the specific infectious agent. Thus the presence of the tubercle bacillus in material coughed up from the lungs is now generally accepted as evidence of pulmonary tuberculosis, although this may not be revealed by the usual physical examination. In diphtheria, where the diagnosis is uncertain, a microscopical examination of the exudate, together with culture experiments made by an expert bacteriologist, may settle the question. In suspected cases of glanders in horses the diagnosis may be established by inoculating a guinea-pig with pus from a suppurating gland, as recommended by Löffler. And in tuberculous cows an early diagnosis may be made by injecting into the suspected animal from 30 to 40 centigrammes of Koch's tuberculin. If the animal is tuberculous a decided febrile reaction occurs in from twelve to fifteen hours; and this is even more marked in early cases, in which the diagnosis by other methods is most difficult, than in advanced cases. The reliability of this test has been demonstrated by extended experiments made, for the most part, by veterinary surgeons in various parts of Europe.

Here we might stop a moment to refer to the practical results which have been obtained in France, and elsewhere, in protecting domestic animals from certain infectious diseases to which they are subject by Pasteur's method of inoculation with an attenuated virus. But it is our intention to limit the scope of this paper to human pathology. The

inoculations made to prevent the development of hydrophobia in persons bitten by rabid animals, however, require brief mention. For, although the specific infectious agent in rabies has not been demonstrated, and the inoculations made do not involve the use of bacteriological methods, the discovery of their prophylactic value is a result of preceding bacteriological researches.

We give below two tables,¹ one showing the results of inoculations made at the Pasteur Institute in Paris during five years—1886 to 1890 inclusive, the other a classified statement showing the results in a single year—1890.

	No. treated.	Died.	Mortality.
1886	2671	25	0.94 per cent.
1887	1770	13	0.73 "
1888	1622	9	0.55 "
1889	1830	6	0.33 "
1890	1540	5	0.32 "
Total	9433	58	av. 0.61 "

In the following table A includes all persons treated who had been bitten by an animal proved to be rabid, B persons bitten by animals examined by veterinary surgeons and pronounced rabid, C persons bitten by animals suspected of being rabid. The figures relate to the year 1890:

	No. treated.	Died.	Mortality.
A	416	0	0
B	909	4	0.44 per cent.
C	215	1	0.46 "

But, as announced at the outset, the principal object of the present paper is to bring to your attention certain recent researches which lead to the hope that we are on the eve of a new departure in the specific treatment of infectious diseases.

As is well known to members of the profession, the researches of bacteriologists have established the fact that the pathogenic action of those bacteria which have been shown to be concerned in the etiology of specific infectious diseases is due to the formation of toxic products during the active development of the bacterial cells. The discovery of these toxines and toxalbumins has led to a line of research work, the object of which is to isolate and study each of these toxic products separately by the methods of chemistry and of experimental pathology.

In the course of these experiments, and of the extended researches which have been made with reference to the explanation of natural and acquired immunity, the remarkable discoveries which will occupy our special attention have been made.

¹ From the *Annales of the Pasteur Institute*, vol. v. pp. 345, 346.

The discovery of the "anti-toxines" is so recent, and the facts relating to their specific antidotal power so unexpected, that I may be permitted to go into some detail with reference to the experimental data which form the basis of our present knowledge.

The demonstration by Nuttall, Buchner, and others, that the blood-serum of certain animals possesses decided germicidal power, led to researches with reference to the nature of the particular substance to which this action is due. Buchner¹ showed that it does not depend upon the cellular elements of the blood, and inferred from his experiments that it must be an albuminoid body. The researches of Martin and Hankin² confirmed this view. These investigators succeeded in obtaining from the spleen and lymph glands of rats, which animals have a natural immunity against anthrax, a globulin which they believe to be the active germicidal agent in the blood and tissues of these animals. Additional facts of importance were developed by the experiments of Ogata and Jasuhara,³ who showed that the blood of an immune animal—dog or frog—injected into a susceptible animal—mouse—shortly before or after inoculating it with a virulent culture of the anthrax bacillus, protects the animal from a fatal attack of anthrax, and that after its recovery from the mild attack which results, the animal is immune against the action of virulent cultures. The protective influence is exercised when the blood is injected as long as seventy-two hours before the inoculation, or five hours after, and it is not lost when the blood used for the antidotal injection has been preserved for weeks in a cool place. It is completely destroyed, however, by exposing this blood for an hour to a temperature of 45° C. A single drop of frog's blood sufficed to preserve a mouse from the fatal effects of an anthrax inoculation.

It is evident that these facts, if well established, have immense significance from a therapeutic point of view; but they are so novel and so unexpected, that we might regard the results reported with some scepticism, were it not that they are supported by similar facts obtained in other infectious maladies by independent investigators. First in date and importance are those of Behring and Kitasato,⁴ published soon after the results of the above-named Japanese investigators had been made public in a communication to the medical faculty of the Imperial University of Japan, at Tokio.

The experiments of Behring and Kitasato showed that the blood of animals which have an artificial immunity against tetanus, or against diphtheria, when injected into susceptible animals preserves them from fatal infection with virulent cultures of the bacillus of tetanus or of diphtheria. So small a quantity as 0.2 c.c. of blood from an immune

¹ Archiv f. Hygiene, 1890, Bd. x.

² Brit. Med. Journ., May 31, 1890.

³ Centralbl. f. Bakteriöl., 1891, Bd. ix. p. 25.

⁴ Deutsche med. Wochenschr., 1890, No. 49.

rabbit, injected into the cavity of the abdomen of a mouse, was sufficient to protect it from the fatal effects of a virulent culture of the tetanus bacillus, injected twenty-four hours later. Further, these bacteriologists have shown that the toxic substance—toxalbumin—present in a filtered culture of the tetanus bacillus is neutralized by admixture with the blood of an immune rabbit. A culture, ten days old, was sterilized by filtration; this filtrate was found to kill a mouse with certainty in less than two days when injected into the animal in an extremely minute quantity—0.0001 c.c. Five c.c. of blood-serum from an immune rabbit was added to 1 c.c. of this virulent filtrate. At the end of twenty-four hours four mice received, each, 0.2 c.c. of the mixture, containing more than three hundred times the fatal dose of the filtered culture. All of these mice survived and proved subsequently to be immune for virulent cultures of the tetanus bacillus, while four control mice, each of which was inoculated with 0.001 c.c. of the same filtrate, unmixed with blood, perished within thirty-six hours. The blood of rabbits not immune against tetanus was without result in neutralizing the toxalbumin in filtered tetanus cultures, as was also the blood of children, of calves, sheep, and horses.

Similar results have been obtained by the Italian investigators Tizzoni and Cantani,¹ who have given special attention to the study of the chemical characters of the "tetanus antitoxine," which they have isolated from the blood of immune animals. They arrive at the conclusion that it is a globulin, or a substance carried down by the globulin precipitate, and that it is different from the globulin obtained by Hankin from animals immune against anthrax.

Recently a most important experiment, from the point of view presented in this paper, has been made at Padua with the tetanus antitoxine of Tizzoni and Cantani. This was the successful treatment of a case of traumatic tetanus with tetanus antitoxine prepared by the authors named. The case is reported by Dr. Rudolf Schwarz,² assistant to the surgical clinic at Padua.

The patient was a peasant boy, aged fifteen, who wounded himself in the left forearm while attempting to cut a walnut which he had picked up from the ground. There was considerable hemorrhage, which was controlled by the application of a wad of spider's web and a bandage. A return of the hemorrhage induced the parents to take the boy to the surgical clinic at Padua. There, under appropriate treatment, the hemorrhage was arrested and the wound healed. Two weeks after receiving the wound symptoms of tetanus were developed. The patient was admitted to hospital three days later, at which time the jaws were immovable and the muscles of the arm in a state of tetanic rigidity, while other muscles of the trunk and extremities were also involved. Treat-

¹ Centralbl. für Bakteriöl., 1891, Bd. x. p. 785.

² Ibid., Bd. ix. p. 685.

ment with chloral and warm baths was without effect in arresting the progress of the malady, and on the 16th of September, nine days after admission, the patient had eight or nine tetanic convulsions during the night, accompanied by difficult respiration and slight opisthotonus. No improvement having occurred under the treatment employed, it was decided to test the value of tetanus antitoxine which had been sent for the purpose by Professor Tizzoni, who obtained it from the blood-serum of a dog which had been rendered "strongly immune" against tetanus. On the afternoon of September 18th, 15 centigrammes of this antitoxine, dissolved in water, was injected beneath the skin. The same quantity was injected the following day. On the morning of the 20th the patient was decidedly better; on the afternoon of this day he received 25 centigrammes of the antitoxine, and the same amount on the following day. After each injection there was a notable fall in the temperature. The patient continued to improve, and on the 23d all symptoms of tetanus had disappeared.

In a postscript to his communication, Dr. Schwarz states that he has private information of two other patients who have recovered from tetanus under the same treatment—one in the hospital at Colle di Val d'Elsa (Tuscany), treated by Dr. Pacini; the other in the surgical clinic at Innsbruck, treated by Professor Nicoladoni. Another case has since been reported by Finotti.¹

Since the above was written a sixth case, successfully treated, has been reported by Taruffi:²

If further experience establishes the value of this treatment, no physician will fail to recognize the fact that medical science has taken a new departure, and that bacteriological studies have led up to practical results of the greatest importance. Nor is it likely that the therapeutic possibilities in this direction will be limited to the disease in which the successful *experimentum crucis* has been made upon man.

The experiments of Behring give us reason to hope that the potent toxalbumin of the diphtheria bacillus may be neutralized in the bodies of infected individuals. Having succeeded in rendering animals immune against the pathogenic action of the diphtheria bacillus, Behring ascertained that the blood of these animals neutralizes the toxic potency of filtered cultures of this bacillus, either before or after injecting it into susceptible animals.

Another disease in which extremely promising experimental results have been obtained is croupous pneumonia. The experiments of G. and F. Klemperer³ show that the blood-serum of animals which have an artificial immunity against cultures of *micrococcus pneumoniae crouposæ*—so-called "*diplococcus pneumoniae*"—when injected into other susceptible animals renders them immune; and, also, when injected

¹ Wiener klin. Wochenschr., 1892, No. 1.

² Centralbl. f. Bakteriöl., May 16, 1892.

³ Berliner klin. Wochenschr., 1891, Nos. 34 and 35.

into the circulation of animals inoculated with a virulent culture of this micrococcus it has a curative action, apparently depending upon its power to neutralize the toxic products to which the pathogenic effect of these cultures is due, as in the cases heretofore mentioned. The authors named found no difficulty in establishing immunity in rabbits, by injecting filtered cultures into their tissues, but they found that this immunity was only established after an interval of several days, indicating that a certain time is required for the reaction on the part of the tissues which results in the formation of an antitoxine. But the blood of an immune animal, containing this antitoxine, when injected into the circulation of a susceptible animal confers immunity upon it at once.

Similar results have been obtained by Emmerich and Fawitzky,¹ whose researches relate both to pneumonia and to the disease of swine known in Germany as *rothlauf* (hog-erysipelas). They report their success in arresting the fatal malady resulting from the injecting into rabbits of cultures of the micrococcus of pneumonia or the bacillus of rothlauf, by injecting into these animals, after infection, the blood or tissue juices of immune animals. When the injection is made shortly before inoculation with a virulent culture, infection does not occur. As a result of their investigations the authors referred to express the hope that croupous pneumonia in man may be arrested by a similar mode of treatment.

From analogy, based upon the experimental evidence heretofore referred to, the successful treatment of tuberculosis would appear to call for the administration of an anti-tuberculin rather than that of the active toxic principle elaborated by the tubercle bacillus. And already we have experimental evidence indicating that this is the case.

The Italian investigators Tizzoni and Cantani² have recently published a preliminary communication, in which they give the results of experiments which appear to show that in guinea-pigs treated with tuberculin, by Koch's method, a substance is developed which neutralizes the tubercle virus either *in vitro* or in the body of an animal inoculated with a pure culture of the bacillus.

The facts already stated would lead to the inference that animals which have an artificial immunity against rabies as a result of inoculation with an attenuated virus, owe this immunity to the presence of an antitoxine in their blood or tissue juices. This inference is supported by recent experimental evidence. Professor Tizzoni and his associate, Dr. Schwarz, have published an important paper in the *Annales de Micrographie*, January, 1892, in which the following results are reported:

Blood-serum taken from a rabbit which has an artificial immunity

¹ Centralbl. für Bakteriöl., Bd. x, 1891, p. 714.

² Ibid., 1892, Bd. xi. p. 82.

against rabies has the power of neutralizing, *in vitro*, the virulence of the spinal marrow of a rabid animal, after a contact of five hours. The blood-serum of dogs which have an acquired immunity against the virus of rabies has a similar action, but in a much slighter degree.

The substance present in the blood-serum of an immune rabbit, to which its antitoxic action is due, *does not dialyse*. It is precipitated by alcohol, and preserves its activity, to a considerable extent, after being precipitated. It has the characters of a globulin. It is soluble in glycerin.

Blood-serum from an immune rabbit has the power of neutralizing the virus of rabies not only *in vitro*, but also in the body of an inoculated animal. And the experimenters named succeeded, as a rule, in conferring immunity upon susceptible animals by inoculating them with blood-serum containing this antitoxine. They also obtained evidence of its curative power when injected into inoculated animals some time after the inoculation. The antitoxine of rabies, as also that of tetanus, is found only in the serum of the blood, and not in the tissues—nervous or muscular—or in the parenchyma of the various organs, liver, spleen, and kidneys.

Finally our authors state their belief that the use of this antitoxine may probably be substituted for Pasteur's inoculations with an attenuated virus, with a view to preventing the development of rabies in man after the bite of a rabid animal. And, also, that it may prove to be curative after the symptoms of rabies are developed.

I have now to refer to other investigations of great importance in their bearing upon the subject under consideration. Professor Ehrlich,¹ of Berlin, has recently published his researches with reference to the pathogenic action of certain toxalbumins not produced by bacteria, but which are similar in composition and in toxic action to some of those extracted from cultures of pathogenic bacteria. He has shown that susceptible animals may be made immune against the toxic action of these proteids, and that the blood and tissue juices of the immune animal contain an antitoxine to which this immunity is due.

Dr. Sewall² showed several years ago (1887) that immunity from the toxic action of rattlesnake venom may be produced by the previous injection of small doses of the "hemi-albumose" to which it owes its potency.

In this connection we may remark that there is some evidence to show that persons who are repeatedly stung by certain poisonous insects—mosquitoes, bees—acquire a greater or less degree of immunity from the distressing local effects of their stings.

¹ Deutsche med. Wochenschr., 1891, No. 44.

² Journal of Physiology, 1887, vol. viii. p. 203.

The experiments of Ehrlich were made with toxalbumins of vegetable origin: one—*ricin*—from the castor-oil bean; the other—*abrin*—from the jequirity bean. The toxic potency of ricin is somewhat greater than that of abrin, and it is estimated by Ehrlich that one gramme of this substance would suffice to kill one and a half millions of guinea-pigs. When injected beneath the skin, in dilute solution, it produces intense local inflammation, resulting in necrosis. Mice are less susceptible than guinea-pigs, and are more easily made immune. This is most readily effected by giving them small and gradually increasing doses with their food. As a result of this treatment the animal resists subcutaneous injections of two hundred to four hundred times the fatal dose for animals not having this artificial immunity. The fatal dose of abrin is about double that of ricin. When injected into mice in the proportion of 1 c.c. to 20 grammes of body weight a solution of one part in 100,000 of water proved to be a fatal dose. The local effects are also less pronounced when solutions of abrin are used; they consist principally of an extensive induration of the tissues around the point of injection, and a subsequent falling off of the hair over this indurated area. When introduced into the conjunctival sac, however, abrin produces a local inflammation in smaller amounts than ricin, a solution of 1:800 being sufficient to cause a decided, but temporary, conjunctivitis. Solutions of 1:50 or 1:100 of either of these toxalbumins, introduced into the eye of a mouse, give rise to a panophthalmitis which commonly results in the destruction of the eye. But in mice which have been rendered immune, by feeding them for several weeks with food containing one of these toxalbumins, no reaction follows the introduction into the eye of the strongest possible solution, or of a paste made by adding abrin to a little 10 per cent. salt solution. Ehrlich gives the following explanation of the remarkable degree of immunity established in his experiments by the method mentioned:

“All of these phenomena depend, as may easily be shown, upon the fact that the blood contains a body—*antiabrin*—which completely neutralizes the action of the abrin, probably by destroying this body.”

In a more recent paper Ehrlich¹ has given an account of subsequent experiments, which show that the young of mice which have an acquired immunity for these vegetable toxalbumins may acquire immunity from the ingestion of the mother's milk. And, also, that immunity against tetanus may be acquired in a very brief time by young mice through their mother's milk. In his tetanus experiments, Ehrlich used blood-serum from an immune horse to give immunity to the mother mouse, when her young were already seventeen days old. Of this blood-serum 2 c.c. were injected at a time on two successive days. The day after the

¹ Zeitschr. f. Hygiene, 1892, Bd. xii. p. 183.

first injection one of the sucklings received a tetanus inoculation, by means of a splinter of wood to which spores were attached. The animal remained in good health, while a much larger control mouse, inoculated in the same way, died of tetanus at the end of twenty-six hours. Other sucklings inoculated at the end of forty-eight and seventy-two hours after the mother had received the injection of blood-serum, likewise remained in good health, while other control mice died.

In a recent communication (1892) Brieger, Kitasato, and Wassermann¹ have published the results of their interesting experiments with a bouillon made from the thymus gland of the calf. It was found that the tetanus bacillus cultivated in this bouillon did not form spores, and had comparatively little virulence. Mice or rabbits inoculated with it in small doses—0.001 to 0.2 c.c. for a mouse—proved to be subsequently immune. And the blood-serum of an immune rabbit injected into the peritoneal cavity of a mouse—0.1 to 0.5 c.c.—was found to give it immunity from the pathogenic action of a virulent culture of the tetanus bacillus. Similar results were obtained with several other pathogenic bacteria cultivated in the thymus bouillon—spirillum of cholera, bacillus of diphtheria, typhoid bacillus.

A most interesting question, growing out of these extraordinary experimental results, at once presents itself. Does the animal which is immune for one of these toxalbumins also exhibit immunity as regards the toxic action of the other? This question Ehrlich has answered. His experiments show that animals which are immune against one of these substances are quite as susceptible to the toxic action of the other as if they did not possess this immunity—*i. e.*, the antitoxine of ricin does not destroy abrin, and *vice versa*. As an illustration of the fact he states that in one experiment a rabbit was made immune for ricin to such an extent that the introduction into its eye of this substance in powder produced no inflammatory reaction. But the subsequent introduction of a solution of abrin, of 1 : 10,000, caused a violent inflammation.

Evidently these facts are of the same order as those relating to immunity from infectious diseases, and taken in connection with the experimental data previously referred to, give strong support to the view that the morbid phenomena in all diseases of this class are due to the specific toxic action of substances resembling the toxalbumins already discovered, and that acquired immunity from any one of these diseases results from the formation of an antitoxine in the body of the immune animal.

In the case of a number of infectious diseases it is demonstrated that the toxalbumin is produced by a specific microorganism. But we have

¹ Zeitschr. f. Hygiene, 1892, Bd. xii. p. 137.

no satisfactory evidence that this is the case in the strictly contagious eruptive fevers. So far as these diseases are concerned, the doctrine of a *contagium vivum* rests solely upon analogy, and upon the assumption that the evident increase in the quantity of the infectious material which occurs in the body of an infected individual is proof of self-multiplication, which is a property of living matter only. While fully recognizing the force of this reasoning, we must insist that the experimental evidence at present available does not justify a generalization to the effect that all infectious diseases are due to specific microorganisms. And it seems worth while to at least stop to inquire as to the possibility of a different explanation in those diseases, such as smallpox and scarlet fever, in which there is no evidence of an increase of the specific poison outside of the bodies of infected animals, and in which a living infectious agent has not been demonstrated. Is it possible that in these diseases the toxalbumin which gives them their specific character is a product of the living cells of the body of the infected animal? Other questions which remain to be settled relate to the production and retention of antitoxines in the bodies of immune animals. Is production continuous during immunity, or does it occur only during the modified attack which results from inoculation with an attenuated virus, or of filtered cultures, the antitoxine being subsequently retained in the circulating blood? The latter supposition does not, at first view, appear very plausible. But it must be remembered that *these albuminous bodies do not dialyse: i. e.,* they do not pass through animal membranes, and consequently would not readily escape from the bloodvessels, notwithstanding the fact that they are held in solution in the circulating fluid. On the other hand, the passage of the tetanus antitoxine into the mother's milk, as shown by Ehrlich's experiments upon mice, indicates a continuous supply, otherwise the immunity of the mother would soon be lost.

Evidently the production of an antitoxine during an attack of any one of the infectious diseases would account for recovery in non-fatal cases; and it may be that this is the true explanation of self-limitation in diseases of this class. If Nature adopts this method of cure, we but follow her if we seek to introduce more of the antitoxine for the purpose of arresting the progress of cases of unusual severity and fatal tendency.

In the experiments of G. and F. Klemperer, it was noted that when the serum of an immune animal was injected into the circulation of an animal suffering from septicæmia, resulting from infection with mic. pneumoniæ crouposæ, the temperature was promptly reduced to the extent of two or three degrees centigrade. And in the case of tetanus reported by Schwartz, the temperature fell a degree or more after each injection.

Although the production of these antitoxines in considerable amounts for therapeutic use will be attended with difficulties, there can be no

doubt that methods will be devised for obtaining them on a large scale as soon as it is definitely established that they may be successfully used as specifics in the treatment of infectious diseases.

In diseases which are common to man and the lower animals, the source from which they may be obtained is evident. But in the diseases peculiar to man, we do not at present see just how they are to be obtained. Reasoning from the analogy afforded by the experimental evidence heretofore referred to, we infer that the blood and tissue-juices of an individual who has recently suffered an attack of smallpox or scarlet fever contains an antitoxine which would neutralize the active poison of the disease in the circulation of another person immediately after infection. Whether a small quantity of blood drawn from the veins of the protected individual would suffice to arrest the progress of the diseases mentioned, or to modify their course, can only be decided by experiment. But the experiment seems to me to be a legitimate one. Possibly transfusion of a moderate amount of blood from one to the other might prove to be curative; or, if made in advance of infection, might confer immunity. Or it may be that an antitoxine can be obtained from the blood of vaccinated calves which would have a curative action in smallpox. This possibility I have undertaken to determine by the experimental method, and now make the following preliminary communication relating to the results already obtained:

The following experiments have been made with the kind assistance of Dr. Wm. E. Griffiths, who has for many years been engaged in the production of vaccine virus in the city of Brooklyn, and consequently is an expert in the vaccination of calves, and in recognizing vaccinia in these animals. Upon visiting Dr. Griffiths, and making known to him my desires, I found him quite willing to assist me; and, also, that he had a recently vaccinated, and, consequently, immune calf in his stable. This animal had been vaccinated in numerous places, upon the abdomen and thighs, fourteen days previously. The vaccination was entirely successful, and a large number of quills had been charged from the vesicles which formed. At the time of my visit for the purpose of collecting blood-serum from this animal, dry crusts still remained attached at the points where vaccination had been practised two weeks previously. On the 28th of April I collected blood-serum from a superficial vein in the hind leg of this calf. This blood was placed in an ice-chest for twenty-four hours, at the end of which time the clear serum was drawn off in Sternberg's bulbs. Four drops of this serum were placed in each of two small, sterilized glass tubes. In one of these we placed three quills charged with fresh vaccine lymph from a calf; at the end of an hour the quills were removed, after carefully washing off in the serum the lymph with which they had been charged. In the other tube we mixed with the four drops of blood-serum an emulsion made from a fragment of a perfectly fresh vaccine crust from the arm of a child; this was crushed upon a piece of glass, and rubbed up with a little of the same blood-serum. The two tubes were now placed in an ice-chest for twenty-four hours, at the end of which time the contents were used

to vaccinate a calf purchased for the purpose. Dr. Griffiths carefully shaved the thighs of this calf, and scarified each thigh in several places, as he is accustomed to do in vaccination for the propagation of lymph. The contents of the tube containing lymph from the quills were rubbed into the scarified places upon one thigh, and the contents of tube containing the emulsified crust into the other. On the 8th of May, nine days after the vaccination, the calf was carefully examined, and it was ascertained that the result of the vaccination was entirely negative.

Evidently it was necessary to make a control experiment before we would be justified in ascribing this negative result to a neutralization of the virus by some special substance present in the blood-serum of an immune calf. Possibly the blood of a non-immune calf might also, after an exposure of twenty-four hours, neutralize the specific virulence of vaccine lymph. The control experiment was made as follows:

On the 9th of May we collected blood from a vein in the leg of a non-immune (not vaccinated) calf; this was placed in the ice-chest for twenty-four hours, and the following day clear serum was collected in Sternberg's bulbs; three quills charged with fresh lymph from a calf, of the same lot as those used in the previous experiment, were placed in four drops of this blood-serum in each of two small glass tubes. As in the previous experiment the lymph was washed from the quills at the end of an hour, and the tubes were placed aside in the ice-chest. At the end of twenty-four hours the serum in these two tubes was used to vaccinate the same calf which had served for the previous experiment. Several points were scarified upon the left thigh and upon the left side of the abdomen, which were carefully shaved for the purpose.

At the same time the animal was vaccinated upon the right thigh and upon the right side of the abdomen with virus mixed with blood-serum from the immune calf. This serum, collected in Sternberg's bulbs on the 28th of April, had since been kept in the ice-chest. One hour before the vaccination four drops of this blood-serum were mixed with one drop of liquid lymph, which had been recently collected by Dr. Griffiths, in a capillary tube, from a vaccinated calf. At the same time three quills charged with bovine lymph were immersed in four drops of the same blood-serum—from immune calf. As stated, the animal was vaccinated upon the right side of the abdomen and upon the right thigh with this virus, which had been exposed for one hour to the action of blood-serum from an immune calf. The serum containing the liquid lymph was rubbed into the scarifications on the right side of the abdomen; the serum containing lymph from the quills into the right thigh. On the 19th of May, eight days after the vaccination, the animal was carefully examined by Dr. Griffiths and myself, and the following results noted: Upon the left thigh and left side of the abdomen the vaccinations—from quills in non-immune blood-serum, after twenty-four hours' contact—were entirely successful, the scarifications being surrounded by characteristic vesicles, and covered by characteristic crusts. Upon the right thigh—vaccinations from quills immersed in blood-serum from immune calf for one hour—and upon the right side of abdomen—vaccinations with liquid lymph mixed with blood-serum from immune calf—the result was entirely negative. Several of the scarifications had entirely healed; others were covered with a dry scab, which was easily detached, and under which the scarification was healing, without any appearance of vesicles such as surrounded the scarifications upon the left side.

The result of the experiments made is, therefore, very definite, and shows that the blood-serum of an immune calf contains something which neutralizes the specific virulence of vaccine virus, either bovine or from humanized lymph—crust from the arm of a child.

It is my intention to follow up this line of investigation, to endeavor to isolate this antitoxine of vaccinia, and to test the question of its possible specific action in neutralizing the smallpox virus in infected individuals, either before or after the development of the disease.

LOCAL ANÆSTHESIA AS A GUIDE IN THE DIAGNOSIS OF LESIONS OF THE LOWER SPINAL CORD.¹

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EVERY fact which bears upon the exact localization of disease in the nervous system is entitled to most careful study, for the experience of the past ten years has demonstrated that the surgical treatment of nervous diseases—a treatment more radical, and sometimes attended by far greater success than medical treatment—must rest upon accurate diagnosis.

The study of motor disturbances, both of the form of paralysis and of the form of variations in reflex activity, has made it possible to determine the situation of lesions in the spinal cord with some exactness. The level of the cord at which the various reflex acts are performed is quite well known. The extent through various segments of the cord of those groups of cells which govern various muscles is also settled.²

But the spinal cord has sensory as well as motor functions, and it is only within a short time that the disturbances in sensation occurring in spinal lesions have been utilized for purposes of diagnosis.

This is partly due to the fact that the examination of sensory defects is tedious, and the results may be quite uncertain unless great care is taken in mapping out upon a convenient diagram the areas of anæsthesia. It may be partly due to the fact that the method of examination is often imperfect. For in examining for sensory defects it is always to be remembered that the test involves a contrast between two sensations, a process of comparison in the mind of one perception with another, and unless the two perceptions are presented simultaneously, such comparison is apt to be imperfect. It is not enough to ask a patient whether

¹ Read before the Association of American Physicians in Washington, May 25, 1892.

² See "Syringomyelia," THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, May, 1888.

he feels the touch of the cotton-wool, or the tip of the finger, or the warm or cold test-tube, or the prick of the needle, or the sting of a faradic brush; nor is it sufficient to touch two parts successively, and demand that he compare a sensation with a memory. He should always be tested upon two surfaces simultaneously, and asked if any difference is felt between the sensations. The necessity of this is evident when it is considered, yet observation has convinced me that it is not the method commonly employed. In spinal affections we always have the face as a convenient surface with which to make comparisons; and in the diseases of the lower region of the cord, to which attention is directed in this paper, we have the arms and trunk as a standard of normal feeling.

It has been my good fortune during the past few years to observe a number of patients suffering from disease in or about the lower half of the spinal cord, who have presented very interesting disturbances of sensation. In the medical journals and works I have found a few cases of more or less similar character—some of them with post-mortem records.

I hope to show from their study that a limited area of anæsthesia is produced by a limited lesion in the spinal cord; that as the lesion ascends the cord from its lowest limit upward, the area of anæsthesia extends in a definite manner upon the surface of the body; and that the situation and shape of the area of anæsthesia are positive indications of the level of the lesion in the spinal cord.

These facts are not wholly new. It has long been known that in transverse dorsal myelitis, the band of anæsthesia about the body corresponded to the level of the lesion. But there are many cases of myelitis of the cervical and lumbar regions of the cord in which the exact distribution of anæsthesia has been overlooked. This is especially true of lumbar and sacral myelitis, which is the form most frequently met with, and which alone will be considered in this paper. The situation of the anæsthesia in lesion of the lower part of the cord is such as to escape attention unless searched for; and as the patients lie in bed upon their backs, and sensation is often preserved in the front of the legs and thighs, the examiner, being content with the investigation of these parts, is misled into supposing that there is no anæsthesia.

The exact area of anæsthesia in lumbo-sacral myelitis has been investigated by various clinical observers, and isolated cases have been recorded.¹ Thus Westphal, Rosenthal, Huber, Bernhardt, Oppenheim,

¹ Westphal: *Charité Annalen*, 1882, i. 421. Rosenthal: *Wiener med. Presse*, 1887, xxix, 670. Huber: *Wiener med. Wochenschr.*, 1888, xxxviii. 1310. Bernhardt: *Berl. klin. Wochenschr.*, 1888, xxv. 637. Oppenheim: *Arch. f. Psych.*, 1889, xx. 298. Eulenberg: *Zeitschr. f. klin. Med.*, 1890, xviii. 547. Ross: *Brain*, 1887, x. 333. Thorburn: *Brain*, 1887, x. 381. Osler: *Medical News*, December 15, 1888. Mills: *Medical News*, March 1, 1890. Herter: *New York Medical Journal*, August 22, 1891. Church: *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, April, 1892.

and Eulenberg, in Germany, Ross and Thorburn, in England, and Osler, Mills, Herter, and Church, in this country, have recorded cases. French observers who have made careful study of hysterical anæsthesia have appeared to overlook this subject. The only effort to bring the recorded cases together and make deductions from them has been made by Thorburn in his work upon the *Surgery of the Spinal Cord*. Since that work was written several important cases have been published with autopsies. And as I have had the opportunity of seeing six cases in which limited areas of anæsthesia aided the localization of the lesion, it has seemed proper to record these cases and review the subject carefully.

The cases of special importance will first be described, and the conclusions from their study will then be considered.

CASE I. (Starr.) *Injury; sphincteric paralysis; limited anæsthesia; lower sacral lesion*.—The first case is that of an engineer, J. L., who met with an injury in July, 1891, his engine falling some thirty feet, while he remained in a sitting posture in it, and thus received the blow upon his lumbar region, where there still remains the evidence of injury in a slight protrusion of the first and second lumbar spinous processes, with some induration about them. He found himself unable to rise after the fall, felt much pain in the lower sacral region and at the upper lumbar vertebræ, and at once lost control of his bladder and rectum. For five weeks after the injury he lay in his bed, though able to move his legs freely; and after this he got up and has walked, and now (March, 1892) walks perfectly well. The only evidence at any time of motor trouble was a twitching of the muscles of the outer side of the legs below the knees, which persisted for several months after the injury, but has now passed away. According to his statement, this twitching must have been limited to the peronei in both legs. For four months after the injury he was obliged to use a catheter and to wash out his rectum. At present (March, 1892) his sphincters are not under perfect control, his urine flowing as soon as his bladder is moderately full, though it never dribbles away, and his rectum occasionally emptying itself suddenly. He is however, slowly regaining control of both organs, but there is little resistance at the anus, and he wears a napkin. From the day of the accident to the present time he has felt a numb sensation in the lower sacral region, in the perineum, and back of the scrotum in the area shown in the diagram (Fig. 1). He is an intelligent man, and is quite certain that the sensory disturbances in this area have not varied, having been tested by several physicians since the injury. An examination shows a total loss of temperature- and pain-senses in the area marked out, and a marked diminution, but no loss, of tactile sense. The diminished tactile sense extends over the entire scrotum and posterior half of the penis, and is possibly the reason for an imperfect power of connection of which he complains, his sensations being slight, the flow of semen premature, and erection too short in duration, although he has impregnated his wife since the accident. There is no trace of anæsthesia of any kind elsewhere in his body. His knee-jerks are normal. The gluteal reflexes are absent. No ankle clonus. The complete absence of any symptoms of traumatic neurosis is interesting, and also the gradual improvement in the motor, reflex, and automatic symptoms, the only permanent symptom being the total anæsthesia to temperature and pain and the partial anæsthesia to touch in the limited area.

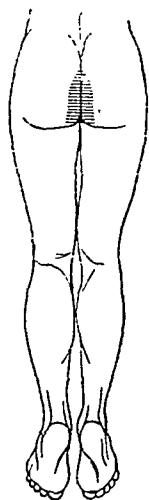
The diagnosis was a hemorrhage in the lowest part of the spinal cord.

CASE II. (Rosenthal.) *Sphincteric paralysis; limited anæsthesia; sacral lesion*.—Female, aged thirty-six years. After exposure to cold and fatigue, felt some pain in urinating and numbness in her buttocks. Four days later

the pain and numbness had increased, she began to have retention of urine, and lost control of her rectum. Seven months later, when seen by Rosenthal, she was found to have anæsthesia to all sensation in the area shown in Fig. 2, including the genitals up to the mons veneris; she had no control of the bladder, which emptied itself spontaneously every two hours; she had no control of the rectum, and could move the bowels by enema only—but was perfectly able to walk. This condition had persisted for four years when the case was reported.—*Wiener med. Presse*, xxix. 670.

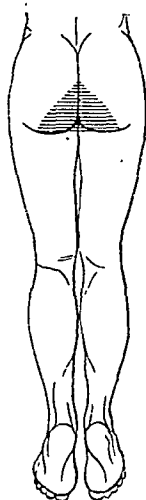
Rosenthal ascribed the condition to a hemorrhage, with destruction of the lowest part of the spinal cord.

FIG. 1.



Starr.

FIG. 2.



Rosenthal.

FIG. 3.



Westphal.

CASE III. (Westphal.) *Sphincteric paralysis; limited anæsthesia. Autopsy—gumma of cauda equina.*—Female, aged thirty-six years; began to suffer in September, 1874, from pain in the legs and fatigue on exertion, with some numbness from the feet to the knees and a disagreeable sensation of pressure in the rectum. Soon afterward she lost control of the rectum, and began to have retention of urine. Then anæsthesia developed in the genitals, perineum, anus, and buttocks. When examined by Westphal, in December, 1874, she was found to be completely anæsthetic to touch, temperature, pain, and electricity in the area shown in Fig. 3, and also in the perineum, vagina, and over the external genitals up to the mons; there was a large bed sore in the anæsthetic area over the sacrum; there was retention of urine, which had to be drawn by catheter, the passage of which she did not feel; there was inability to empty the rectum, except by mechanical means; the anal sphincter was not relaxed, but grasped the finger. Motion was in no way impaired. She died December 27th, and the autopsy showed caries of the sacrum, and a gummy mass with hemorrhagic exudation and connective tissue filling the entire spinal cavity within the sacrum as high as the first sacral nerve, and compressing slightly all the sacral nerves except the first. The spinal cord was normal.—*Charité Annalen*, i. 421.

The following case, reported by Kirchhoff (*Arch. f. Psych.*, x.), is of interest, since it includes a record of post-mortem appearances.

CASE IV. (Kirchhoff.) *Injury; sphincteric paralysis. Autopsy—compression of sacral cord.*—The patient, a man aged thirty years, fell from his horse upon his nates, and felt immediately severe pain in his sacral region, and was unable to rise. For three months he was confined to bed, suffering from pain in the back and retention of urine, which was followed by incontinence of urine and feces; then he was able to go about, though he walked slowly with legs rather separated. Sensation is said to have been retained when he was examined one and a half years after the injury. He gradually recovered entirely, except for the incontinence of urine and feces, which remained till his death one and a half years after the injury. The autopsy showed that a portion of the body of the first lumbar vertebra had been fractured and was compressing the lowest part of the spinal cord, involving the fifth, fourth, and third sacral segments without compressing the cauda equina, the nerves of which were found normal on microscopic examination.

It is not at all impossible that there may have been a limited area of anæsthesia in this case about the perineum which escaped notice, especially if, as in my first case, the sensations of pain and temperature were the only ones permanently lost. Lachmann, however, has recorded (*Arch. f. Psych.*, xiii. 50) a case of tumor of the conus medullaris and filum terminale in which loss of sphincter control was present without any anæsthesia.

CASE V. (Starr.) *Spontaneous hemorrhage into the sacral cord; sphincteric paralysis; limited anæsthesia.*—My second case is that of a woman, R. K., aged twenty-eight years, who was seen with Dr. F. J. Quinlan in October, 1889, and in February, 1890, and whose condition since the last date has been stationary. She was perfectly well until May, 1889, when, after a day of fatigue, she was suddenly seized with severe pain in the sacral region and in the back of both thighs, with retention of urine and feces, and a sensation of numbness over the lower sacral region, in the perineum and vagina. She did not lose her power, and has been always perfectly able to walk. When examined in October, 1889, she was suffering much from pain in the lower part of the sacrum and along the back of the left thigh in the area shown on the diagram (Fig. 4). She had total anæsthesia to touch, temperature, and pain over the area shown, and this included the perineum and anus, and the entire genitalia, excepting the upper part of the labia outside the vulva. Her urine had to be drawn by catheter; her bowels were moved with great difficulty and with much pain. The sphincter ani contracted on the finger. Her knee-jerks were exaggerated. Plantar and gluteal reflexes were normal. There was no tendency to bedsores, no tenderness of the back to pressure or to heat, no girdle sensation, and no anæsthesia of the legs or thighs.

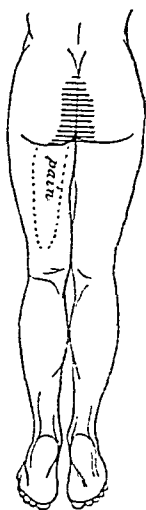
When examined again in February, 1890, she was still perfectly able to walk, but after long standing felt weak in the left leg, and found herself tired more easily than formerly. The leg was not at all atrophied, nor were the muscles paralyzed, but the response to faradism was diminished in the peroneal muscle as 60 to 45. Her bladder and rectum were still beyond her control, and were emptied by catheter and injections. She still had some pain in the back and in the left leg constantly, but recently had suffered more from pain in left ilio-inguinal region. There was no girdle sensation, spinal tenderness or bed sore. The area of total anæsthesia had increased, and now involved the area shown in Fig. 5. A slight degree of impairment of tactile sense was also found on the outer side of the left leg below the knee, and this could be traced from the anæsthetic region downward along a narrow space on the back of the thigh, indicated by the lighter shading in the figure. The original area of anæsthesia has therefore extended. The extension has been into the former area of pain, and the present area of pain has shifted from the back of the left thigh to the left groin.

It is also of interest to find that as the lesion has advanced upward and at last begun to invade the motor part of the spinal cord, it is in the peronei that the first sign of weakness—the diminution of the faradic contractility—has begun, thus confirming the statement of Leyden that these muscles are controlled by the lowest group of cells in the spinal cord (*Klinik der Rückenmarkskr.*, i. 41).

Here, again, as in the first case, it is to be noticed that the areas of tactile disturbance and temperature and pain disturbance do not at present exactly coincide, and this seems to support the original diagnosis of a hemorrhage into the conus medullaris and lower sacral segments of the spinal cord. Such a hemorrhage might set up a chronic meningomyelitis, and as this advanced slowly upward the symptoms would increase as they have done.

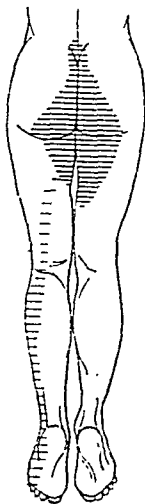
Such was the lesion in the following case of Oppenheim, which is reported with autopsy, and in which it will be noted that the final area of anæsthesia coincides quite closely with that in this case of my own.

FIG. 4.



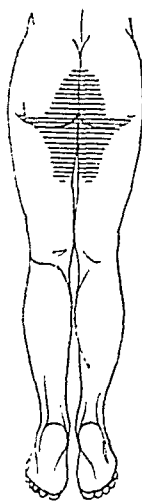
Starr.

FIG. 5.



Starr.

FIG. 6.

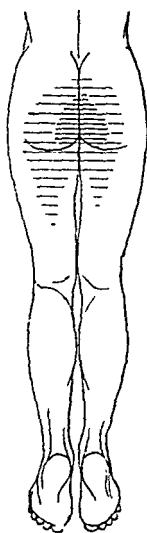


Oppenheim.

CASE VI. (Oppenheim.) *Injury; sphincteric paralysis, limited anæsthesia. Autopsy—hemorrhagic sacral myelitis.*—The patient fell upon his buttocks and immediately lost control of his legs, and felt a numbness in them. His urine was retained. He was taken to Charité Hospital, and observed there until his death, three months later. The permanent symptoms were: loss of Achillis tendon reflex, loss of control of the bladder and rectum, loss of power of erection, loss of sensation, especially for painful sensations in the area indicated in Fig. 6, which included "the entire vicinity of the anus, the gluteal, perineal-scrotal region and the penis, and a narrow area reaching downward on the posterior inner surface of the thighs, and upward over the lower half of the sacrum." It is to be noticed that the loss of the pain-sense was more

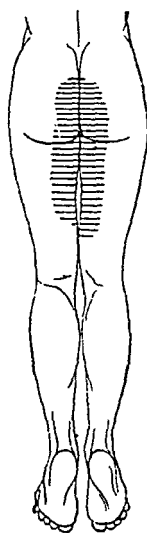
complete than that of tactile sense. The autopsy showed a fracture of the first lumbar vertebra and a crushing of the posterior part of the *conus medullaris* and disintegration of the lower two-thirds of the sacral portion of the cord. "In the lowest portion the posterior half of the spinal cord seemed entirely destroyed, as if it had been cut off by an incision through the posterior columns 1-2 mm. behind the posterior commissure. The boundary is, however, by no means a regular one, but was encroached upon by a thick, very vascular tissue full of round cells, a part of the pia mater infiltrated with granular cells, small and large collections of blood-cells and new capillary vessels. The anterior part of the cord was also altered, being infiltrated with small round cells, while the nerve-cells were in part disintegrated. It was evidently a traumatic myelitis with hæmato-myelia." The only lesion

FIG. 7.



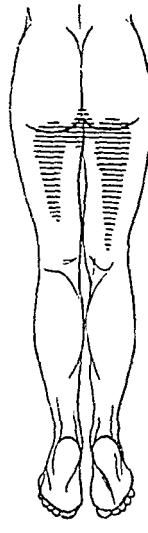
Huber.

FIG. 8.



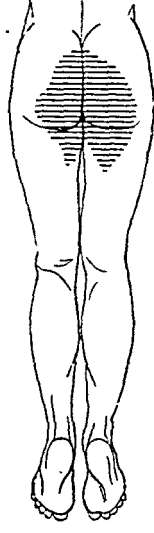
Bernhardt.

FIG. 9.



Osler.

FIG. 10.



Mills.

in the lumbar enlargement was the ascending degeneration in the posterior columns. The nerve-roots coming from the lowest part of the cord were involved in the lesion, being matted together in the thickened pia, but a microscopic examination showed that the nerve-roots which issued from the two upper sacral and lumbar portions of the cord were not affected, although they had to pass through the narrowed canal.—*Arch. f. Psych.*, xx. 298.

Cases almost identical in character are reported by Huber,¹ Bernhardt,² Osler,³ and Mills,⁴ without autopsies. The area of limited anæsthesia is shown in the accompanying figures. (Figs. 7, 8, 9, and 10.)

In the following case, reported by Herter, which was seen by me at his request, the area of anæsthesia was slightly more extensive. The case was completed by a pathological examination.

CASE VII. (Herter.) *Injury; paraplegia, sphincter paralysis, limited anæsthesia. Autopsy—hemorrhage in spinal cord.* Male, aged thirty years, was crushed by a heavy weight on August 26, 1890, and immediately paralyzed

¹ Wien. med. Wochenschr., 1888.

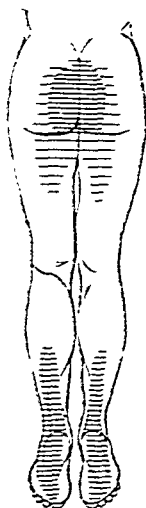
² Berl. klin. Wochenschr., 1888.

³ Medical News, 1888.

⁴ Ibid., 1890.

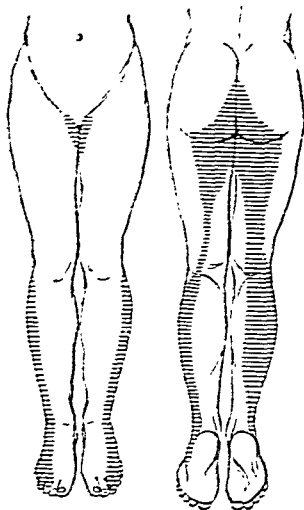
in the legs and had involuntary passage of urine and feces. Five weeks later, when the effects of the shock had disappeared, the paralysis of the feet and legs remained with atrophy and reaction of degeneration below the knees, but the thighs could be moved; the bladder and rectum were totally paralyzed, neither sphincter offering any opposition to pressure; sexual power was lost; a bedsore had formed over the sacrum, and anæsthesia was present in the area shown in the diagram (Fig. 11) and included the perineum and genitals. The darker area over the buttocks was totally anæsthetic to touch, temperature, and pain; the lighter area was partially anæsthetic. The soles and dorsal surfaces of the feet were quite anæsthetic and analgesic. The patient improved during the following five months so that he was able to walk, but the anæsthesia remained the same. I saw the patient, with Drs. McCosh and Herter, in January, 1891. From the beginning there had been a prominence of the first lumbar spine, and on January 27, 1891, the operation was undertaken, and the spines and laminæ of the first, second, and third

FIG. 11.



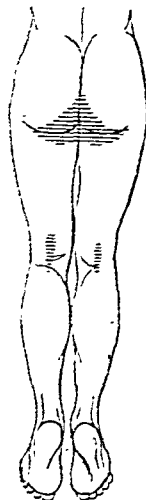
Herter.

FIG. 12.



Eulenburg.

FIG. 13.



Eulenburg.

lumbar vertebræ were removed, and the cauda equina was exposed. Nothing could be found at the operation. The patient died forty-eight hours later.

The autopsy showed the existence of an old hemorrhage and a mass of inflammatory material in the cauda equina and involving the lower three-quarters of an inch of the spinal cord. The nerve-fibres of the most centrally situated strands of the cauda were completely degenerated. The anterior strands also contained degenerated nerve-fibres. The lateral bundles escaped. The conus medullaris was destroyed. The lesion did not reach as high as the fourth lumbar roots, which were normal.—HERTER, *N. Y. Med. Journ.*, Aug. 22, 1891.

In the following case, recorded by Eulenburg, the hemorrhage was spontaneous and not traumatic in origin, and the subsidence of the symptoms indicated a gradual absorption of the clot.

CASE VIII. (Eulenburg.) *Sphincter paralysis, limited anæsthesia*.—Female, aged thirty-six years: had suffered occasionally for five years from endometritis and pains in back and legs, and was suddenly seized at Christmas, 1887,

with severe pain in the back and fell to the ground. For several weeks after this she was in bed, and on getting up limped in walking. In April, 1888, she had another attack of pain in the sacrum, and then developed paralysis of the bladder, with retention of urine and loss of sensation below the waist. Three months later the rectum became paralyzed, being emptied with enema with difficulty, though occasionally an involuntary movement occurred. She was first examined by Eulenberg in February, 1890. She then had pain in the back and in the bladder, with tenderness over the sacro-lumbar articulation. There was anæsthesia in the genitals, perineum, anus, and over the region shown in Fig. 12, the dark shading indicating a total anæsthesia. The gait was slow and uncertain, stepping up being difficult, as were also flexion of the knees and plantar flexion of the feet, the left calf and thigh being weaker than the right and slightly atrophied. Knee-jerks were normal. Achilles reflex lost, and plantar reflex imperfect. No gluteal reflex. All muscles acted to faradism, but it required a stronger current to contract the peronei and ante-tibials than the post-tibials. The bladder was usually emptied by catheter, but spontaneous evacuation occurred frequently. The rectum was beyond control and the sphincter ani was weak. Menses were regular.

Under treatment by strychnine and static electricity there was some improvement, and at the end of four and a half months the anæsthesia was diminished to the limits shown in Fig. 13, the genitals being still affected, this being the region originally of total anæsthesia; there was still imperfect control of bladder and rectum, but the power of the limbs seemed to have returned.—EULENBERG, *Zeitschr. f. klin. Med.*, xviii. 547.

These cases seem sufficient to demonstrate that small lesions in the sacral region of the spinal cord may produce limited zones of anæsthesia on the back, thighs, and outer side of the legs, and that the extent and shape of the anæsthesia vary with the extent or situation of the spinal lesion.

In contrast to these cases the following is of special interest, as it shows that in limited myelitis of the lumbar region the sensory functions of the sacral segments may be preserved and impulses may pass the diseased area of the cord and thus reach the brain.

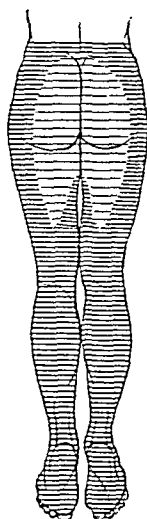
CASE IX. (Starr.) *Central myelitis of the lumbar region, limited anæsthesia; paraplegia.*—The patient, a young married lady, after suffering for some months from backache, was suddenly seized, in May, 1891, with severe pain in the lower dorsal and upper lumbar region, which was much increased by motion and by lying down, and which was soon followed by pain down the left leg in the sciatic distribution. In August, 1891, a swelling appeared at the third lumbar vertebra which gradually disappeared in a month. Its nature is undetermined. On the 8th of August she suddenly lost sensation to heat and to pain in the left leg. On the 16th of September she lost power of motion in the right leg except in the foot. In October the left leg became paralyzed and sensations of touch were also lost. Finally, in November, the right leg became anæsthetic. Early in the disease retention of urine and obstinate constipation appeared and have continued, so that catheterization is necessary. During November the line of anæsthesia advanced slowly upward from the groins to a point half-way to the umbilicus, where it remains.

When she was seen in December, 1891, in consultation with Dr. J. G. F. Holston, there was total paralysis of motion below the waist, including back and pelvis, together with atrophy more marked above than below the knees. All reflex action was abolished. The muscles all reacted to a very strong faradic current, the reaction below the knees being more prompt than above, and there being normal galvanic response below the knees, and equal response to cathode and anode above the knees. The limbs were flaccid—cool, with-

out rigidity—and the occurrence of bedsores, to which there is a tendency in the back, was prevented by frequent change of position. The loss of sensation to touch, temperature, pain, and muscular sense was absolute below the middle of the lower abdomen and first lumbar spine, but on the back, in a saddle-shaped area of the surface shown in the diagram, Fig. 14, these sensations were not lost but only slightly diminished. This area was determined independently by Dr. Holston and myself at different times. This area of sensibility included the anus, perineum, and vagina. The bladder was under no voluntary control, urine being retained till drawn or passed in a stream when the bladder became full, and slight cystitis being present unless the bladder was constantly washed out with borax solution. The sphincter ani offered resistance to the finger. The evacuation of the rectum was difficult with enema, and always painful.

Here there was evidence of a total loss of all the functions of the lumbar segments of the cord, including the first, and of the *integrity of the sacral segments*. Sensory impulses were received in the latter, and made their way upward through the affected lumbar region—a fact which aids the diagnosis, inasmuch as it demonstrates that the myelitis in this region does not affect the posterior columns of the cord at that part, but must be confined to its gray matter and lateral portions.

FIG. 14.



Starr.

FIG. 15.



Starr.

The case is stationary at present (April, 1892). In regard to its diagnosis, it is quite possible to exclude a tumor compressing the cauda equina because of the order of appearance of the symptoms: 1, anæsthesia in left leg; 2, paralysis in right leg; 3, anæsthesia in right leg; 4, paralysis of left leg, an order implying the invasion of the spinal cord from its right half over toward its left half, producing at one stage a true picture of a Brown-Séquard paralysis. The possibility of an intra-spinal tumor or gliomatosis cannot be excluded, and it is very likely the cause of the destructive myelitis present. An operation has, however, been advised against, as it seems improbable that an intra-

spinal tumor could be removed with any prospect of recovery, the necessary destruction of the cord during the operation being liable to leave as serious results as the tumor is now producing. And the fact that sensory impressions pass up the cord at the seat of lesion, indicates that the tumor does not lie on the posterior surface where it might be most easily reached in an operation.

CASE X. (Starr.) *Syphilis of the spinal cord; sphincteric paralysis, limited anæsthesia and hyperæsthesia.*—Male, aged twenty-two years (Vanderbilt Clinic, No. 4711), had syphilis in January, 1891, with well-marked secondary symptoms from which he recovered. In November, 1891, he felt some weakness and numbness of the legs. In December, 1891, after dancing all night, found that he could not pass his water and had to have it drawn. At the same time noticed an increased numbness of his legs and felt weak in walking. Felt as if he were walking on a carpet. These symptoms increased gradually and have continued till the time he was first seen (February 11, 1892). Examination showed inability to control his urine, which at times flowed away when the bladder was full, and at all times was retained; constipation, a slight weakness of the legs, exaggerated reflexes and tendency to spastic gait, and a condition of hyperæsthesia to touch, temperature, and pain in area dotted in the figure (Fig. 15), over buttocks and on the outer calf of each leg and an area of anæsthesia of slight degree over the back of each thigh between the hyperæsthetic areas.

Under anti-syphilitic treatment and rest he recovered entirely in the course of a month.

The presence of a zone of hyperæsthesia around the body in transverse dorsal myelitis is often recognized. It is interesting to find areas of hyperæsthesia in this case, one corresponding to the area of anæsthesia from lower sacral lesions, one corresponding to the area of anæsthesia in lower lumbar regions, with a zone of anæsthesia between them.

The diagnosis of syphilis of the cord may be thought indefinite, and it is not impossible that at the time of sudden increase of his symptoms he may have had a slight hemorrhage into the spinal membranes over the sacral cord. But Erb has recently called attention to a peculiar association of symptoms which he considers characteristic of syphilis of the cord, and the patient's symptoms correspond closely to that condition. These symptoms are slight spastic gait and weakness, with increased reflexes but with very little muscular rigidity, interference with the bladder functions, and slight disturbances of sensation chiefly of the nature of paræsthesia in the legs. There are no symptoms above the waist. The onset is at first gradual, but the symptoms may increase suddenly, and under treatment may pass away. It will be seen that this case corresponds quite closely to this description.

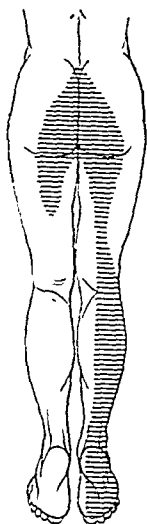
CASE XI. (Starr and Lloyd.) *Injury; compression of cauda equina; localized paralysis; sphincteric paralysis; limited anæsthesia; operation; recovery.*—Male; was struck, in April, 1889, on the back while in a kneeling posture, and sustained a fracture of the lumbar vertebræ. He was immediately paralyzed in his right leg; had loss of bladder and rectal control, and a considerable degree of anæsthesia whose area is uncertain. A year later he was seen

by me with Dr. Samuel Lloyd.¹ There remained a deformity of the lumbar region most marked at the third lumbar vertebra. There was total paralysis with atrophy and reaction of degeneration of the peronei, anterior and posterior tibial and glutei muscles of the right leg, and some weakness in the muscles of back of the thigh. There was diminished knee-jerk and no ankle clonus. There was loss of control of the bladder and rectum. There was anæsthesia in the area shown in the diagram (Fig. 16) to touch, temperature, and pain.

The diagnosis of compression of the cauda equina at the third lumbar level being made, Dr. Lloyd operated and removed the second and third lumbar spines and laminæ. The patient subsequently recovered very slowly but entirely from all his symptoms.

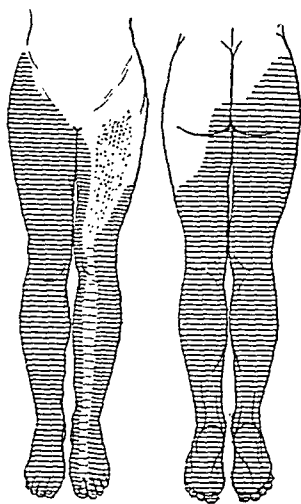
CASE XII. (Starr and McBurney.) *Injury; paraplegia, limited anæsthesia; operation; improvement.*—Male; suffered a fracture of the lumbar vertebræ in June, 1891, and was immediately paralyzed in both legs; lost control of his sphincters and had a loss of sensation in the legs. This anæsthesia, he said,

FIG. 16.



Starr and Lloyd.

FIG. 17.



Starr and McBurney.

was at first as high as the umbilicus and extended about the body, but within a month of the injury decreased slightly and had become permanently limited to the regions shown in Fig. 17. Bedsores developed soon. His condition had been stationary from August to October, when he was seen by me in Roosevelt Hospital at Dr. McBurney's request.

I found a total paralysis with reaction of degeneration of all the muscles of the lower extremities, with atrophy, loss of reflexes and of mechanical excitability, the abdominal muscles, however, being under control, and abdominal reflex preserved; complete loss of sensation in the area shown in the figure, to touch, thermic and painful and electric irritation, and an area of marked hyperæsthesia on the left thigh in front over the region dotted. He

¹ Dr. Lloyd has reported the case in full in *THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES*, July, 1891.

had no idea of the position of his feet and legs in bed or when moved. He had no control over his bladder, and his rectum was evacuated with difficulty by enemata. He had a deep bed sore over the sacrum, and bed sores on the ankles were prevented with difficulty. The deformity at the first, second, and third lumbar vertebræ was well marked, the second lumbar spine being deflected an inch to the right.

On October 31st Dr. McBurney removed the spines and laminæ of these vertebræ, revealing a fracture of the body of the second lumbar vertebra. The cauda equina was compressed between the body of the vertebra, which had been split off and projected backward, and the laminæ chiefly on the right side. When the cauda was entirely freed, pulsation returned in its vessels and in the dura. The dura was opened necessarily, and it was evident, from the appearance of the nerve-trunks, that they were degenerated. The wound healed promptly. The bed sores healed within three weeks of the operation. The control of his bladder and rectum had partially returned three months later, but no change in motion or sensation had been produced at the end of six months. He has suffered very greatly from pain in his legs ever since the operation.

The areas of anæsthesia and hyperæsthesia are interesting, and must have been due to compression of the entire cauda equina at the second lumbar nerve, being greater on the right side than on the left. It is evident that the bundles of the cauda lying on the surface on the left side were the only ones to escape.

CONCLUSIONS.—There are a number of interesting facts to be drawn from the study of the cases here collected.

First, *as to the location in the spinal cord of the centres of control of the bladder and rectum.* These centres appear to be uniformly affected together, and, therefore, must be adjacent to one another. The control of the sphincters is lost when the lesion involves the lower three sacral segments, and the centres probably lie in the lower two segments of the cord. This is proven by the autopsies in the cases of Kirchhoff, Westphal, Oppenheim, and Herter, and by the distribution of sensory symptoms in two of my cases, and in those of Rosenthal, Bernhardt, Eulenberg, Mills, and Huber. In these cases without autopsy the situation of the anæsthesia was such as to show that the lesion was limited to the two or three lower sacral segments, and in all the control of the sphincters was lost.

When these segments are destroyed, the sphincter of the rectum is relaxed and there is no opposition to the introduction of the finger into the anus. The entire rectum also loses its power of contraction so that it is only emptied by pressure from above or by artificial evacuation by means of enemata or excavation.

The sphincter of the bladder does not appear to be permanently relaxed when the cord is destroyed. At any rate a constant dribbling of the urine rarely, if ever, occurs. There is, however, a moderate incontinence, for as soon as a few ounces of urine collects in the bladder the pressure overcomes the slight resistance of the sphincter and the urine flows away. Hence a frequent emptying of the bladder without

the knowledge of the patient takes place. There is rarely a sufficient resistance offered by the sphincter to cause a retention of urine and distention of the bladder when the lesion destroys the bladder centres. This is much more liable to occur when the lesion lies at a somewhat higher level in the upper sacral region and produces an irritation of the mechanism of the bladder. It seems to occur also when the lesion involves the cauda equina, producing pressure on the nerve roots. Since pressure upon a nerve elsewhere never produces tonic spasm, this effect must be of a reflex nature from compression of the sensory filaments.

If, in a case of paraplegia, the mechanism of the bladder and rectum is not interfered with—if these organs empty themselves naturally when full—in spite of or without the knowledge or control of the patient, it is a proof that the lesion has not destroyed the lower sacral segments of the spinal cord. In such cases the exact area of anæsthesia should be carefully determined, for the information thus afforded may enable an exact diagnosis of the situation of the lesion and also of the actual extent on the cord to be determined. (See Case IX.)

Secondly, *as to the distribution of anæsthesia in lesions of the lower part of the spinal cord.* This is shown in the diagrams (Fig. 18). These diagrams have been prepared by carefully comparing and superposing the charts of cases cited. In some cases the area of anæsthesia was strictly limited from the outset to a special region. In other cases the area of anæsthesia was large at the outset and gradually diminished in extent. In other cases still the area of anæsthesia was at first small and then increased. The three sets of cases, therefore, must agree in their results, in order to establish any conclusion as to the areas of anæsthesia produced by lesions at various levels. And if the cases here collected be carefully studied, it will be seen that they do thus agree. In the diagram of the back it is possible to outline seven concentric zones of anæsthesia, starting from the lowest part of the sulcus between the buttocks as a centre. These are numbered *I.* to *VII.* in the diagram.

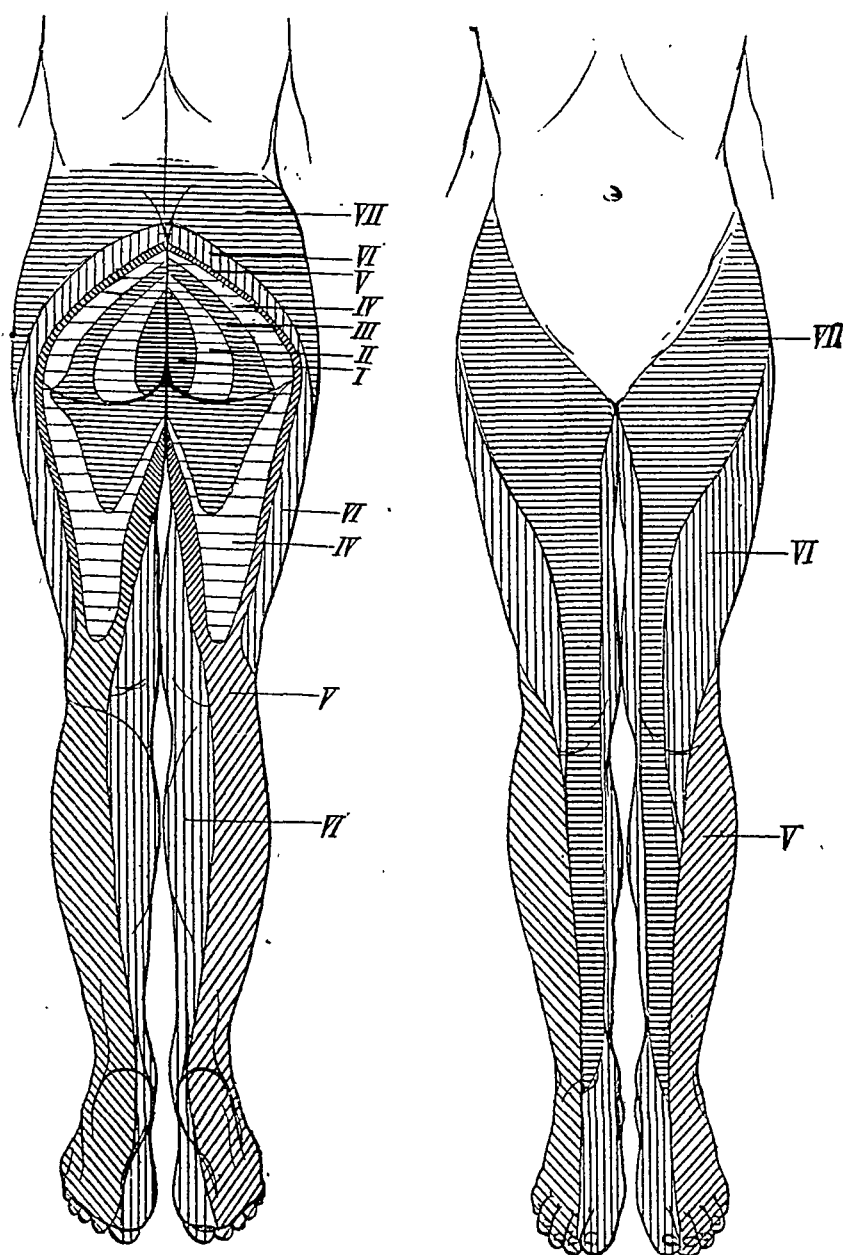
I. The *first zone* is oval in shape, small in extent, and includes the perineum, the posterior part of the scrotum in males, the vagina in females; it also includes the mucous membrane of the rectum.

II. The *second zone* is heart-shaped—point up—and includes the entire scrotum and posterior surface of the penis and mucous membrane of the urethra in males—the entire genitals of the female, except the outer surface of the labia majora and the mons veneris.

These two zones can be separated clinically, for in some cases the smaller zone only has been anæsthetic. In the majority of cases the larger zone has been found anæsthetic. No autopsies are at hand to enable a distinction of lesion to be made between these two zones, but from the cases of Kirchhoff, Westphal, and Herter it is possible to

affirm that the second zone is produced by a lesion involving the conus medullaris and the fifth and fourth sacral segments of the cord.

FIG. 18.



Areas of anæsthesia in lesions at various levels of the spinal cord from sacral v. to lumbar ii.

I. Sacral v.

II. Sacral iv.

III. Sacral iii.

VII. Lumbar ii.

IV. Sacral i.

V. Lumbar v.

VI. Lumbar iii.

III. The *third zone* is considerably larger, involving a greater surface of the buttocks and extending down the back of the thighs over a triangular area, point down. This has been named the "saddle-shaped area," coinciding about with the surface of the seat in contact with the saddle when riding. A zone of anæsthesia of this shape is due, as the autopsy in Oppenheim's case shows, to a lesion involving the fifth, fourth, and third sacral segments.

IV. The *fourth zone* is of a similar shape to the third, but more extensive, a greater surface on the back of the thighs being involved, and the anæsthesia extends in a band almost as low as the popliteal space. This area has been established clinically in several cases: there is as yet no autopsy to determine its lesion; but since the smaller zone is due to lesion at the third sacral segment, and the next larger zone is due to lesion in the fifth lumbar segment, it is allowable to conclude that this region corresponds with the second and first sacral segments.

In thus outlining four zones of the skin and assigning them to various segments of the sacral portion of the spinal cord, it is not my intention to lay down artificial boundaries or to affirm that all cases will exactly coincide. The lesions in the sacral cord are not limited exactly to one or two segments. The sacral cord is small in extent and lesions involve it to a greater or lesser degree, consequently these zones are not always symmetrical on the two sides of the body; the lesion being a little higher on one side of the cord than on the other, the zone of anæsthesia will be greater on one thigh than on the other, as in my first, fifth, and sixth cases, and in those of Herter, Mills, and Osler. I only wish to show that as the cord is invaded by disease from below upward, the area of the skin which becomes anæsthetic increases in extent, and that the shape of the area is characteristic; so that from the study of the area the extent of the lesion can be determined.

I also desire to call attention to the fact observed in my fourth case, that this area of the skin which corresponds to the sacral cord may remain sensitive in a lesion of the lumbar cord, when that lesion is so limited in extent as not to cut off impressions passing from the sacral cord to the brain. This affords an important evidence of the extent of a lesion in the lumbar cord. For if that lesion is transverse and involves all the columns, all sensation below its level will be lost, while, if the lesion is limited and does not affect the posterior columns of the cord through which impulses are passing up from the sacral region, the total anæsthesia will not include the parts of the skin related to the sacral cord.

Another conclusion of some importance is brought out from a study of these facts, viz., that in locomotor ataxia the lesion probably begins quite uniformly in the lumbar cord, and not in the sacral cord. In a review of about fifty cases of locomotor ataxia, of which I have careful records,

I find that the lightning pains of the initial stage and the hyperæsthesia especially to cold, which accompany them, are rarely referred to the buttocks and seat. They are quite uniformly referred to the feet or to the legs below the knees or to the front and outer sides of the thighs. Pain in the rectum, it is true, may be felt. In one of my cases the initial paræsthesia and anæsthesia occurred in the rectum and perineum, the complaint for several months being of a feeling as if a large cannon-ball were lying on the perineum. But such localization of pain and paræsthesia is the exception. If, however, the lesion of locomotor ataxia began in the sacral portion of the cord, it is reasonable to suppose that the sensory symptoms would be referred to the region of the body corresponding to that part of the cord, and that bladder disturbance would be the first symptom. It seems, therefore, quite probable that the lesion in locomotor ataxia begins in the lumbar region—a fact to which the early loss of knee-jerk also points. This may have a bearing on the disputed question as to whether locomotor ataxia is a true “system disease.”

The area of anæsthesia produced by lesions in the lumbar cord is also determined by these cases and shown in the diagram.

V. The *fifth zone* of anæsthesia is seen to include the first four zones and to extend down the back of the thigh through the popliteal space in a band, and then to descend the outer surface of the leg to the foot. In some cases it ends at the ankle, in others it involves the entire side of the foot, dorsum, and sole, and three and a half toes. Eulenberg's case, cases of Kahler¹ and Mills² not cited here, and my second and fifth cases demonstrate this distribution. When a lesion extends from the sacral into the lumbar cord the anæsthesia extends from the thigh down the outer side of the leg. This area then corresponds to the fifth lumbar segment of the cord.

VI. The *sixth zone* of anæsthesia is produced by a lesion of the third lumbar segment. When the third lumbar segment is diseased, the entire back of the thighs and legs is anæsthetic and the front of thighs is also anæsthetic, except over a funnel-shaped zone which extends from above downward, the narrow tube of the funnel reaching along the shin even to the foot. This distribution of anæsthesia is well shown in Fig. 17, where the sensitive area in the midst of the anæsthetic zone is well defined. This zone will probably be separated later into two separate parts corresponding to lesions of the fourth and third lumbar segments. There is not as yet a sufficient number of cases to warrant such a distinction. The exact limits of anæsthesia on the feet are still uncertain, and no more exact statement than that given is warranted. It is quite common to find the inner arch of the foot sensitive when the

¹ Kahler: Prager med. Wochenschr., 1882.

Mills: Med. News, March 1, 1890, Case 1.

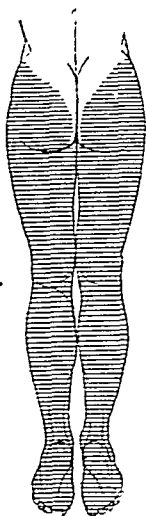
toes and heel and entire dorsum are anæsthetic, and it is probable that the higher the lesion the greater the anæsthesia on the foot.

VII. The last and *largest zone* of anæsthesia shown in the diagram is produced by a lesion of the four lower lumbar segments, that is, by destruction of all but the first lumbar segment of the cord. It will be noticed that the line of anæsthesia is much lower in front than behind, and that it follows the line of Poupart's ligament. It is only when the first lumbar segment of the cord is invaded that the abdominal wall becomes anæsthetic.

From this level upward the zone of anæsthesia extends around the body in a girdle, and there is no difficulty in locating the level of the lesion in the dorsal cord.

It is to be remembered that in all these lesions and areas of anæsthesia, the *anus, perineum, and the genitals are included in the insensitive region*. This is an important fact in the differentiation of cases of organic from functional paraplegia. It is also to be noticed that the shape of the area of anæsthesia in the back differs in organic and in functional cases.

FIG. 19.



Charcot.

Charcot¹ and his pupil, Souques,² have described the area of anæsthesia in hysterical paraplegia, in paraplegia produced by hypnotic suggestion, and in the analogous form of functional paraplegia occurring after railroad and other injuries, and included under the general name of traumatic neurosis or traumatic hysteria. Fig. 19 shows Charcot's diagram. He says: "In front the limit of anæsthesia is represented by a line which follows the fold of the groin on each side to the anterior spine of the ilium, *exclusive of the genital organs*; on the back the line follows the insertion of the muscles of the buttocks exclusive of a V-shaped area over the sacrum." It will be noticed how entirely different this area of anæsthesia is from that due to any of the organic lesions described here. And the escape of the genital organs in the functional cases is also a most important point of diagnosis between hysterical and organic paraplegia.

The study of the area of anæsthesia, therefore, not only enables us to reach a diagnosis of the level of the lesion; but it also enables us to separate organic cases of spinal-cord disease from functional and hysterical cases of a paraplegic kind.

Multiple neuritis is sometimes attended by anæsthesia of the extremities. The anæsthesia is limited, however, to the hands and feet, or if it

¹ Charcot: *Œuvres complètes*, iii. p. 448.

² Souques: *Iconographie de la Salpêtrière*, iv., 1891.

extends up the limbs it is limited by a line drawn around the legs or forearms below the knees or elbows. It never resembles in its distribution the area of anæsthesia produced by lesions of the spinal cord.

Nor can the anæsthesia from injury of special nerve trunks be confounded with that due to spinal disease, as a reference to any diagram of the distribution of the cutaneous nerves will show.

Thirdly, in cases of transverse dorsal myelitis with a zone of anæsthesia about the body; there is usually present a zone of hyperæsthesia just above the zone of anæsthesia. An analogous condition has been observed in cases of lumbar and sacral myelitis, as shown by three of my own cases (Cases V., X., XII.). But in these cases the region of hyperæsthesia was situated in the area of the surface corresponding to the segments of the cord just above the lesion. In Case V. the area of anæsthesia corresponded to a lesion of sacral v. and iv., the area of pain and hyperæsthesia corresponded to sacral iii. As the disease extended, the zone formerly hyperæsthetic became anæsthetic. In Case X. the area of anæsthesia corresponded to a lesion of sacral iii. and iv.; the hyperæsthesia corresponded to sacral iv. and v. below, and to sacral i. above. In Case XII. the area of anæsthesia corresponded to a lesion of lumbar iii. and below it; while the area of hyperæsthesia on the left side corresponded to the funnel-shaped area belonging to lumbar ii. Thus the study of the areas of hyperæsthesia confirms the conclusions reached from a study of the areas of anæsthesia.

It may be affirmed that in lesions of the lower cord an area of hyperæsthesia will be usually discovered in the part of the body corresponding to the segment of the cord just above the lesion. And when a lesion is extending, the area previously hyperæsthetic will become anæsthetic. If the diagram be consulted, some conclusion regarding the extent of any given case can be drawn from a study of the relative positions of the areas of hyperæsthesia and anæsthesia.

Lastly, a few words must be added regarding the differentiation of lesions of the spinal cord from those of the cauda equina. The study of the anæsthesia alone does not aid very greatly in the differentiation. A lesion of the sacral nerve roots produces an identical area of anæsthesia as a lesion of the sacral cord. It also produces a paralysis of the bladder and rectum. Thorburn¹ has proved that pressure exerted on the cauda equina affects the nerves in the middle of the cauda to a greater extent than those near the surface. "Those nerves which pass out lower down are, in the cauda, situated nearer the middle line than those which pass out above them, and hence they would appear to have more room to escape from pressure, and we might expect them to suffer less rather than more; but that the contrary is the case is an established fact, and

¹ The Surgery of the Spinal Cord, p. 99.

we are able definitely to conclude that in a pressure lesion of the entire cauda equina those nerve roots which emerge lower down are more seriously injured than those above them." This conclusion has been proven by the autopsy in Herter's case, where the middle roots only were degenerated, though the pressure was exerted on all the roots at the level of the last lumbar nerve.

There is no way, therefore, of determining by a study of the anæsthesia alone a pressure lesion on the cauda high up from a destructive lesion in the cord at its lowest extremity.

The diagnosis may, however, be made, first, from a study of the surgical indications, chiefly of the nature of deformity, the relation of the vertebræ to the segments of the cord being remembered. The cord ends at the first lumbar vertebra, hence any fracture below that is necessarily compressing the cauda equina. Secondly, the diagnosis may be made from a study of the paralysis which accompanies the anæsthesia. This paralysis is very slight in lower cord lesions, being confined to the peronei muscles when the lesion is at or below the second sacral segment; it involves the anterior tibial and posterior tibial muscles when all the sacral segments are involved, and only invades the movements of the hip-joint when the entire lumbar region of the cord is affected.¹ In cauda lesions, on the other hand, the pressure on the nerve roots is often sufficient to produce widespread paralysis when sensation is but slightly affected.

The cases in which autopsy or operation has revealed the nature of the lesion in diseases of the lower cord demonstrate, however, that a sharp differentiation between cauda equina and cord lesions is not often justifiable. In the four autopsies here cited, both cord and cauda were invaded by the lesion, which was a meningo-myelitis with hemorrhage, the result being a destruction of the lower cord and a matting together of the nerves of the cauda in a mass of inflammatory material. It seems, therefore, questionable whether, except in cases of fracture below the first lumbar vertebra with displacement of the vertebræ, any sharp line of distinction between cord and cauda lesions should be attempted. It is chiefly in the surgical cases that operative interference has been attempted, and here, as already stated, the surgical rather than the medical facts have been the surest guides to the operation.

There is one case on record, however, of successful operation for removal of a tumor compressing the cauda equina (Laquer, *Neurol. Centralbl.*, 1891, x. 193). In this case the extreme pain in the sacral region and the tenderness over the sacral region appear to have been the particular symptoms which guided the operator; the tumor was extra-dural, and the nervous symptoms were by no means such as to

¹ For more precise statements see "Syringomyelia," THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1888.

suggest a lesion of the spinal cord. In two other cases of tumor of the cauda equina—viz., those of Simon (*Arch. f. Psych.*, 1875) and Lachmann (*Ibid.*, 1882), the characteristic nervous symptoms of compression of the cauda were wholly wanting, and the cases were not diagnosticated during life.

Some writers upon the differential diagnosis between cord and cauda equina lesions have laid stress upon the fact that sensations of touch, temperature, and pain are not always equally destroyed, and have sought to conclude that this inequality of sensory disturbance was evidence of cord lesion as distinguished from cauda equina lesion. The cases here cited of Herter and Oppenheim, with autopsies, and two of my cases, in which the operation showed the lesion to be a compression of the cauda without lesion of the cord, prove that this point of differential diagnosis is not well taken. In both cord and cauda lesions the disturbance of tactile sense may be more or less extensive than that of the senses of pain and temperature.

It is evident from the facts here presented that a careful study of disturbances of sensation is a valuable aid in the diagnosis of the situation of lesions in the spinal cord and cauda equina. It is, however, to be remembered that anæsthesia is but one of a series of symptoms entering into that diagnosis, and the condition of reflexes, and the power, tone, and electric reactions of the muscles are not to be neglected in the examination of any case. It is only when *all* the signs of a local lesion coincide that the diagnosis is an absolute one.

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RADICAL CURE OF PSOAS ABSCESS.

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THE treatment of psoas abscess secondary to disease of the spine has from time immemorial been extremely unsatisfactory, and even at the present day many different practices are followed.

Deckers, writing in 1693, advised opening the abscess with a trocar; he left the canula in the cavity, stopped with a *cork*, and let out the pus at intervals. Benjamin Bell adopted a similar proceeding.

Liston advised opening the abscess when it pointed, and says: "In these cases the discharge is generally profuse, long continued, and attended with exhaustion and hectic, gradually but surely destroying the patient." "Opening the cavity and shutting it up again, however carefully conducted, is in almost every instance followed by alarming and hazardous results." Lawrence and Sir Astley Cooper, on the other hand,

strongly recommended Abernethy's plan, which consisted in "puncturing the abscess obliquely, and so producing a valvular opening; evacuating the pus in a continuous stream, so that no air should gain admittance." "When the abscess is emptied as much as possible, the wound should be attentively wiped, the edges placed in exact contact and retained in that state by strips of plaster." Other writers, as Kirkland, preferred the abscess to burst of itself. Dupuytren and John Pearson both considered it dangerous to open a psoas abscess on account of the almost inevitable hectic fever.

In the present day we have much less hesitation in operating, and the treatment that is probably usually adopted is, in the first instance, absolute rest; and if, in spite of this, the abscess continues to increase, it is opened and drained from the loin, as advised by Mr. Treves, the bodies of the diseased vertebræ examined from the wound, and sequestra removed if found; the strictest antiseptic precautions being maintained throughout the whole course of the case. Some surgeons speak very highly of an injection of iodoform emulsion into the abscess-cavity; but, as Mr. Erichsen, says, further experience is required before its true value can be ascertained.

Though quite appreciating that the antiseptic method has put the treatment of psoas abscess upon an entirely different footing, still, as a matter of practical experience, the treatment usually adopted leaves much to be desired.

I am quite aware that in a number of cases the abscess has disappeared and the patient has been cured simply by means of prolonged and absolute rest. But, unfortunately, a large proportion of patients suffering from psoas abscess are of the poorer classes, and absolute rest (especially in the case of children) outside a hospital is quite out of the question. On the other hand, if the abscess is opened and drained, the discharge is so profuse and long continued that antiseptics breaks down, and the case not unfrequently terminates either in lardaceous disease or general tuberculosis.

Most favorable results are now obtained in the treatment of wounds, by closing them without drainage and applying pressure, a practice that I adopt in all suitable cases.

Last year Mr. Arthur E. Barker brought forward at the London Clinical Society some cases of psoas abscess in which he had succeeded in obtaining primary union, with obliteration of the abscess-cavity, after opening the abscess in the loin, thoroughly scraping and washing its walls, and then closing the wound without drainage. The favorable results obtained by Mr. Barker induced me to adopt a similar practice. The cases I have operated upon in this manner are four in number, and in every one of them primary union with obliteration of the abscess-cavity resulted.

In one of my cases twenty ounces of pus were evacuated ; on examining the vertebræ with my finger, from the wound, a loose sequestrum the size of one's thumb-nail was felt lying in the side of one of the bodies of the lumbar vertebræ, and was removed. The walls of the cavity, lined with a thick, slimy membranous layer, the so-called "pyogenic membrane," were carefully scraped with a Volkmann's spoon until, as far as could be ascertained, the whole of it was removed, the lining walls now presenting a comparatively rough feel. The abscess-cavity during and after the scraping was thoroughly washed with a hot but weak antiseptic solution, a little iodoform dusted in, and the wound closed without drainage. Firm pressure by means of a pad of wood-wool wadding was applied over the situation of the psoas muscle anteriorly, and the thigh on the affected side was fixed. There was no rise of temperature after the operation. The wound was dressed on the following day, as the child had soiled her dressings, and again on the ninth day, when it was found completely healed, and there was absolutely no evidence of re-accumulation in the abscess-cavity. The patient was discharged in a Sayre's jacket and a hip Thomas, and when shown with the other three cases at a meeting of the Liverpool Medical Institution four months afterward, there was not the slightest evidence of a psoas abscess.

One of the other cases, a girl three years of age, on whom I operated in October, 1891, was in a most unfavorable condition, for, besides spinal caries and a psoas abscess, the child had necrosis of the frontal bone, disease of both elbow-joints, and disease of the tarsus. It is now six months since the operation, and there is not the least sign of a psoas abscess.

It certainly was somewhat of a surprise to me that an abscess-cavity containing twenty ounces of pus could be thus obliterated, but the explanation I take to be as follows : On first opening the abscess and passing one's finger into the cavity, it is, so to speak, lost in a sea of pus, and it may be only with extreme difficulty that one can make out its boundaries. After all the pus has been evacuated, the walls collapse somewhat and readily come within reach of the finger, and, after the scraping and washing with hot antiseptic solution, the walls become further collapsed, are thrown into folds, and the opposing surfaces come into contact. The "pyogenic membrane" having been removed, these folds become adherent one to the other, blood-clot replaces the pus, and in turn is replaced by fibrous tissue, and so obliteration of the abscess-cavity is completed. It is now more than twelve months since I operated upon my first case, and the child is at present in good health, and there is not the least sign of a psoas abscess.

As regards the details of the operation it is only necessary to say that strictly antiseptic precautions must be taken before, during, and after the operation. The abscess must be opened in the loin, for one is then near the seat of disease, and is thus enabled to examine the bodies of the diseased vertebræ and remove any loose sequestra. The lotion used for washing out should be weakly antiseptic but decidedly hot (about as

warm as the hand can bear), for not only does it thus cause the abscess-walls to be thrown into folds, but also arrests any bleeding that not unfrequently takes place from vessels contained in the ruptured fibrous bands sometimes found crossing the abscess-cavity.

The after-treatment, of course, should be directed to the diseased spine, which will require mechanical support, and to improving the general health of the patient.

In relating these favorable results I trust I may induce other surgeons to adopt a practice at once so simple and so satisfactory; and I am sure the profession owes a debt of gratitude to Mr. Barker for being the first to demonstrate its practicability.

LIVERPOOL, April, 1892.

GANGLION AND TENO-VAGINITIS TUBERCULOSA.

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II. TENO-VAGINITIS TUBERCULOSA.

THIS subject stands in such close relation to the foregoing one,¹ affecting as it often does the very region in which ganglia are most commonly met with, and such has been the confusion existing between true ganglion and the subject under consideration, commonly called by English physicians compound ganglion, that the two may well be considered in conjunction. Not improbably this designation "compound ganglion" has done much to increase the indefinite conception of what is meant by the term ganglion. To-day there can, however, be no doubt but that ganglion and all the forms of tuberculosis of the tendon-sheaths have nothing in common; they are separate affections, and should therefore have dissimilar names.

The preceding paragraph presupposes that true ganglion is not tubercular in origin. The possibility of such an origin is one which, as far as I know, has yet to find expression in print. Against the idea speak two circumstances: no tubercle bacilli have been found in a true ganglion, and second, a localized tuberculosis of the skin and subcutaneous structures has never been reported as following the rupture of a ganglion, an inoculation experiment. The recognition of tuberculosis of the tendon-

¹ Evans: "Ganglion and Teno-vaginitis Tuberculosa," THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES. June, 1892, p. 643.

sheaths probably dates from the time of Jobert, who designated it as white swelling of the tendon-sheaths. Olav Acrel¹ first described the rice bodies, corpora oryzoidea, and the affection was then known as "ganglion crepitans Acrelii." Later on, Dupuytren's name was associated with the affection, and especially with that of the palm of the hand. Berger² attributes the first description to Michon, in 1851; following whom, he says, came Bidard, 1858; Cazanov, 1866; Heinecke, Notta, 1860; Barwell, 1858; Foucher, 1862; Annandale, 1865; Lanceraux, 1873.

The relation of the rice bodies to tuberculosis of the tendon-sheaths was first observed by Baumgarten.³ Independently of him, Riedel⁴ and Koenig⁵ made the same discovery both for tendon-sheath and joint affections, and Hoeftman⁶ found that hygroma proliferum, Virchow, was also a tubercular affection.

Tuberculosis of the tendon-sheaths may be primary or secondary; the latter form is much the more common, being usually an extension of the tubercular process from a neighboring bone or joint to the affected sheath or sheaths, but as its symptoms and its gravity are masked and thrown into the shade by the bone or joint affection, it will be to the primary form of tubercular teno-vaginitis that especial attention will be directed.

Berger divides the subject as follows:

1. Primary tuberculosis of the tendon-sheaths.
 - a. Acute.
 - b. Chronic.
 - a. The non-purulent form.
 - β. The purulent form.
2. Secondary tuberculosis of the tendon-sheaths.
 - a. The non-purulent form.
 - β. The purulent form.

1. *Acute Primary Tuberculosis of the Tendon-sheaths.*

Under this heading we would understand the development of miliary tubercles on the inner surface of the sheaths or on the tendons themselves. This form has never been described, yet the possibility of such a thing, say as part of an acute miliary tuberculosis, cannot be denied.

The chronic tuberculosis of the tendon-sheaths may, since the tendon sheath is but a closed sac with parietal and visceral layers, be either

¹ Comment. Soc. Reg. Sci. Gottingensis, tome ii. 112.

² Deutsch. Zeitschr. f. Chir., 1885, xxi. 335.

³ E. Neumann: Königsberg. Arch. f. mikros. Anat., 1880, xvii. 130.

⁴ Deutsch. Zeitschr. f. Chir., 1878, 45.

⁵ Die Tuberculose der Knochen u. Gelenke.

⁶ Ueber Ganglion u. chron.-fung Sehnenscheiden-entzündung (Hygroma proliferum, Virchow), Königsberg, 1876.

diffuse or circumscribed. Of the diffuse form two varieties have been recognized, either of which may become purulent; they are the fungous and the hygroma forms. The circumscribed affection appears always to occur in the granuloma form. It is, however, liable to break down and infect the whole sheath. Thus it would seem better to change Berger's table:

"b. Chronic.

"a. The non-purulent form.

"β. The purulent form."

into—

b. Chronic.

a. Diffuse.

- | | |
|------------|-----------------------------|
| 1. Fungous | } purulent or non-purulent. |
| 2. Hygroma | |

β. Circumscribed.

1. Granuloma, purulent or non-purulent.

Taking up for consideration—

a, 1. *Chronic diffuse fungoid tuberculosis of the tendon-sheaths* (teno-vaginitis tuberculosa, chronica, diffusa, fungoidea)—a rather long name, but one, like those of modern organic chemistry, which describes what it represents: The beginning is extremely chronic, and usually no cause can be ascribed, except, perhaps, an injury. Its localization is most commonly upon the hand or foot, and in these places an isolated tendon-sheath is more frequently affected than the larger compound ones which envelop such aggregations of tendons as those of the flexors—a point of difference between this and the hygroma form. A slight swelling occurs along the tendon, and since this in the diffuse variety involves the whole extent of the tendon-sheath, this swelling slowly increases, so that after the lapse of some time, years, during which interval little or no inconvenience has been occasioned, the tumor protrudes slightly above the level of the skin.

The swelling, as Berger (*loc. cit.*) says, affecting the finger-sheaths of the flexor tendons, appears as a worm- or sausage-like tumor, which can be easily palpated, is well defined, and reaches from the middle of the palm up to the finger-tip, the finger-tip or berry remaining normal. That is, the distribution of the tumor is exactly that of the entire finger sheath of the flexor tendon. The skin over the tumor is normal. The tumor is plastic, at times fluctuating. Very little or no pain or tenderness is complained of.

As contents of the sheath we find, not what is often expected, a fluid, but a grayish-red, sarcoma-like fungus which surrounds the tendon. The entire sheath is usually completely filled, as if both the parietal and visceral layers had been affected and the growth from them had occluded the sheath cavity. The parietal layer may, however, be alone affected;

in this case there is found, at times, a central cavity filled with slimy fluid in which rice bodies may or may not be present.

The pathological anatomy of this affection is so exactly similar to that of fungous disease of the joints that a reference to the same will suffice.

Cases. Berger (*loc. cit.*) reports one case in which there existed the central cavity surrounding the tendon; the little finger was the seat (primary?) of a diffuse fungous affection of the tendon-sheath. Besides the swelling on the volar aspect of the little finger, the palm of the hand presented a diffuse, deep swelling, and the region of the wrist, dorsal and volar, was similarly affected. After an exploratory incision the case came to amputation.

Falkson (*loc. cit.*) operated upon the same individual twice; the operations were three years apart and on different hands. At the time of the second operation the hand first operated upon (the right) was functioning normally, though, at the operation, the entire sheaths of the second and fifth fingers were dissected out, and the ligamentum carpi dorsalis almost completely removed. The tendons were not affected. Union *per primam*. Three years later the left hand was operated upon, the same fingers (second and fifth) being affected in a similar manner, and the same kind of operation performed. In this case the tendons were so affected that under a stream from an irrigator they separated into bundles of fine fibres. The result of the operation was very satisfactory.

Doyen¹ reports a case of fungous teno-vaginitis of the index finger which, after two attempts at cure by Championnière, came to disarticulation. The whole sheath of the flexor tendon of the index finger was filled with a fungous material which, on microscopical examination, was found to consist of tubercles whose centres had, in part, undergone degeneration.

Beach.² Fungous disease of the sheath of the extensor longus digitorum of foot. Incision disclosed a mass of cheesy nodules lying in a matrix of translucent, gelatinous material, with some small pockets of a yellow fluid, all being connected with the tendon-sheath. Microscopical examination showed tubercles.

Golding Bird.³ Over the tendon of the extensor carpi ulnaris dext. and extending three inches upwards from the insertion of the tendons, was a swelling which seemed precisely like that of an ordinary ganglion, except that it had two hernia-like projections above the general line of the tumor. On incision a solid, transparent granulation or pulpy material was found, out of which the tendon emerged. Excision, scraping. Recurrence in six months. No doubt as to its being primary. The wrist-joint was not affected.

¹ Prog. Méd., Paris, 1883, xi. 394.

² Boston Med. and Surg. Journ., cxx. 559.

³ Trans. Path. Soc., London, 1888-89 xl. 244

α, 2. The *hygroma* form of the chronic diffuse tubercular teno-vaginitis (teno-vaginitis tuberculosa, chronica, diffusa, hygromatosa) is that variety which has already been mentioned as being, at times, called "compound ganglion;" ganglion crepitans Acrelii; ganglion of Dupuytren; hygroma proliferum. It is, though not a common affection, perhaps the most frequent form of primary tuberculosis of the tendon-sheaths.

As to etiology, we must here, and in the fungous variety, regard the local infection with the germ of tuberculosis as the primary cause. What the predisposing causes are it is difficult to say. Probably, in a general way, they are the same as those which predispose to other forms of tuberculosis. English writers, in this as in many other affections, have sought to find a causal relation in rheumatism and gout. As to time of life, though not limited to any age, the affection is certainly more frequent in early adolescence than in either childhood or old age.

As to localization, the region of the wrist is by far the most commonly affected part, and here, again, the sheaths of the flexor tendons suffer more frequently than those of the extensors. The exact anatomical situation is not as yet quite settled—if, indeed, it is not variable. This much, however, is certain: the sheaths of the flexors of the thumb and little finger always communicate with the sheaths of the flexor tendons which lie in the palm of the hand, while the finger portions of the sheaths of the flexors of the others fingers do not so communicate, and hence their affections may be limited, while those of the thumb and index finger almost of necessity involve the palm of the hand.

Gosselin and Michon (*loc. cit.*) assert that there are always several synovial sacs which pass under the volar carpal ligament: an ulnar sac enclosing the flexor tendons for the fourth and fifth fingers, and a radial sac for the tendon of the long flexor of the thumb, while the flexor tendons for the index and middle fingers lie between the two sacs, but possess no proper synovial envelope. The hygroma affects most frequently the ulnar sac, hence suppuration would cause stiffness of the fourth and fifth fingers. The skin over the tumor is normal and movable, except when suppurative changes have set in.

The size varies greatly. The form, however, is almost constant, as the tumor possesses the marked peculiarity of being bilocular or compound. The explanation of this is a purely anatomical one: the fluid poured out into the sheath sac distends the same, and the greatest distension must necessarily be where there is the least resistance, that is, above and below the annular ligament of the wrist. Thus these tumors are made up of two communicating sacs, one above, the other below the wrist, the one on the forearm, the other in the palm of the hand, when the tumor occupies its most common situation on the volar surface of the wrist

region. Most usually the fluid can be pressed out of one sac into the other, causing the latter to increase in size and to become more tense.

Very frequently during this act or during simple palpation of the exquisitely fluctuating tumor, a peculiar, soft crepitation may be felt (hence the appellation *crepitans*), due in all probability to the presence of certain bodies known as *corpora oryzoidea* or rice bodies.

Lücke thinks that the cyst formation occurs from the sheath of the flexor profundus, and speaks of the difference in appearance of the palmar tumor depending upon whether the affection remains confined beneath the palmar fascia, or, penetrating the same at one or more places, causes the upper surface of the tumor to possess rounded projections. He further insists upon it that that portion of the tumor which belongs to the index finger sheath almost invariably stands out alone or buries itself beneath the muscles of the ball of the thumb.

The contents of the tumor are, as the name *hygroma vel hydrops tuberculosus teno-vaginale* would indicate, fluid—a clear, transparent fluid, very thin and of a specific gravity but little above that of water, thus contrasting markedly with the contents of true ganglia—and in this fluid float a greater or less number of the *corpora oryzoidea*. The quantity of these rice bodies varies from very many to very few—indeed they may fail entirely, and yet the affection be a tubercular and not a simple dropsy of the tendon sheath. The latter affection, simple dropsy of the tendon-sheaths, is becoming more and more rare the more frequently the cases are operated upon (Koenig, *loc. cit.*).

One point must be insisted upon: between the hygroma and the fungous forms come a variety of intermediate affections in which the relative quantity of fluid decreases as the quantity of rice bodies of both kinds, floating and attached, increases.

The pathological anatomy of this variety is, *cæteris paribus*, the same as the fungous, except that, added to the tubercular disease of the sac walls, we have a greater or less amount of fluid present. The rice bodies, which will be considered further on, may be regarded as tuberculous portions of the sac wall rubbed off by the action of the tendon. During the course of the affection, which is quite chronic, there develops a weakness of the flexors, an impairment of the function of the hand, an inability to flex the distal phalanges, and, at times, pain up the arm from pressure on the nerves.

Suppuration of the sac, with the resulting contractures, if nothing worse, is a not uncommon termination for untreated cases or for those on which palliative means have been tried.

Cases. Dr. Bennet¹ reports a case of hygromata affecting the hand; there were two large tumors, one on the palmar, the other on the dorsal

¹ Dublin Journ. Med. Sci., 1877, lxiv. 261.

surface, and each extended above and below the annular ligament. Besides these, there were other tumors on the thumb, index, and middle fingers. All crepitated distinctly, "which distinguishes them from ganglion."

Both dorsal and palmar tumors were aspirated, the rice bodies expressed, and strong tincture of iodine injected. No reaction, some thickening; the smaller tumors disappeared spontaneously, though no connection could be made out.

v. Mosengeil¹ punctured a large ganglion (hygroma) of the flexors of the hand and wrist. Little fluid, but many rice bodies were removed. Puncture repeated and case thought to have been cured.

J. S. Wright² reports two cases of compound ganglion of the flexor tendon-sheaths of the hand. In the one, suppuration had already taken place and the abscess pointed through the palm. The other was operated upon by incision into the sac, above and below the annular ligament, the contents being evacuated.

Rouse³ reports a case of two years' standing in which the tumor involved the whole palm and the lower four inches of the forearm. Two small sinuses existed on the proximal side of the annular ligament, out of which semi-gelatinous, clear fluid could be pressed. Incision, under antiseptic precautions, above the wrist, and a quantity of fluid and some gelatinous material pressed out. Two months later, suppuration of the sac and amputation through the forearm.

Gerster⁴ operated upon both hands of the same patient—dorsal surface of the right hand, palmar of the left. He called the affection "compound ganglion," but says tubercular material was dissected out. Bandage changed on the tenth day and the case reported as cured.

Berger (*loc. cit.*). The first of the four cases he reports is one of "compound ganglion" of the hand and wrist; operation by incision and curetting; suppuration, however, set in and amputation was resorted to.

β. *Circumscribed chronic teno-vaginitis.* Under this heading we have but one sub-variety to consider—the tuberoso or granuloma form—teno-vaginitis tuberculosa, chronica, circumscripta, tuberosa. It is probably the only form in which the disease occurs.

The point of especial predilection is at the ends of the sheath sac, which, in part, may account for the granuloma form that the growth ordinarily assumes, for the tumors are usually sharply defined, semi-fluctuating, more or less distinctly half-round, and approximately the size of half a walnut.

¹ Archiv f. klin. Chirurg., 1870, xii. 71.

² Med. and Surg. Reporter, Philadelphia, 1881, xliv. 676.

³ St. George's Hospital Reports, 1879, ix. 333.

⁴ Medical Recorder, New York, 1887, xxxi. 277.

Berger¹ says that these tumors are encapsulated, and offers as an explanation for the limitation of the affection to a portion of the sheath a probable agglutination of the parietal and visceral layers, which, supposably, goes hand in hand with the growth of the tumor.

The granuloma, or if one wishes, "tubercular" form of tuberculosis of the serous membranes, is not at all unknown as affecting both the meninges and the peritoneum. If a case of circumscribed teno-vaginitis be left to itself, the tubercle is prone to eventually break down and discharge, usually in one of two directions, either through the skin, when a fistula is formed and the tendon eventually destroyed, or into the sheath sac, when a mixed infection, tubercular and purulent, of the whole, until then unaffected, tendon-sheath takes place.

Cases. Two cases are reported by Berger (*loc. cit.*). The first that of an eight-year-old girl who had, a little below and in front of the outer malleolus, a circumscribed, red, and painful swelling, the size of a quarter of a dollar. Incision showed the swelling to have been filled with thin pus and cheesy material. The tendon of the peroneus longus lay exposed in the cavity. The second case was on the back of the hand, in the region of the head of the fourth metacarpal bone. Two half-round tumors, the one the size of half a hazel-nut, the other of half a walnut, were recognizable, both semi-fluctuating; skin over them was thin but not adherent. Incision proved the tumors to consist of granulation tissue. The extensor of the fourth finger passed through the middle of them. The tumors possessed a kind of connective-tissue capsule. The tendon was apparently healthy. The capsules of the tumors were adherent to the head of the fourth metacarpal bone, which for precaution was resected. Healed in two weeks.

2. Secondary Tuberculosis of the Tendon-sheaths.

Here one might, theoretically, distinguish the same forms as in the primary affection. But the symptoms and signs referable to the tendon-sheath affection are so masked by the accompanying disease, that the subject has not been studied even as thoroughly as the primary form. This, however, we do know: that secondary is much more frequent than primary tuberculosis of the tendon-sheaths, and that the extension of the disease is most frequently from a neighboring bone or joint affection.

Before entering upon the diagnosis and therapy of primary tubercular teno-vaginitis it might be well to consider for a moment the pathological anatomy, especially that of the well-known "rice bodies," and finally, whether or not the tendons are affected.

For the pathological anatomy of the fungous and granuloma forms of tubercular teno-vaginitis one need but refer to the tubercular joint.

¹ Deutsche Zeit. f. Chirg., 1885, xxi. 335.

diseases of similar kind, as described by Koenig in his *Tuberculose der Knochen und Gelenke*. The hygroma form has been described by Virchow under the name of hygroma proliferum.

As to the rice bodies, the first observers thought they were animals, believed they possessed motion of their own, that the affection was parasitic and due to the presence of these animals. Here may be reckoned Olav Acrel, Dupuytren, Raspail, Laennec, Biddar, and Hippolite Cloquet.

Jules Cloquet, on the other hand, shared the idea of Bosc, and says: "M. Bosc a constate que ces corps n'étaient pas des entozoaires, ainsi qu'on avait pu le penser." Those believing, as did Jules Cloquet, that the rice bodies were but organized clots, coming from the thickened and inflammatory synovia, were Bosc, Dumerel, Velpeau, Virchow, Lücke, Volkmann.

Later (see Schuchardt¹) Hyrtl observed the fringed growths on the sac wall, and many were led to believe that these were the true origin of the bodies (Hyrtl, Meckel, Billroth, Virchow, Volkmann, Pitha-Billroth), only to be brought back again to the coagulation of the synovia theory by work done by Virchow—"chemical researches with the rice bodies," which led him to believe them to be a proteid substance, which he regarded as fibrin (*Faserstoff*), and, as coagulation was supposed to take place only in the fluids of the body, the idea naturally followed, that it was in the fluid contents of the hygroma that the coagulation occurred.

We now know, thanks to the work of Schmidt and Weigert, that coagulation does take place in the tissues, and here leads to a necrosis, the so-called coagulation-necrosis. Thus the probability, that the rice bodies are dependent for their origin on the change in the sac wall, again comes to the front.²

Schuchardt,³ based upon microscopical examinations of sections of the sac wall and rice bodies, stained according to the Weigert method, maintains that common fibrin does not occur in the rice bodies, but a chemical substance related to fibrin. He also thinks that the rice bodies are but parts of the synovial membrane and sac wall, for they have exactly the same microscopical structure as have those portions of the sac which have undergone coagulation-necrosis.

The production of the rice bodies may be and probably is due, in part, to the warty outgrowths of the hygroma proliferum, but no doubt is also due to an exfoliation of the necrotic parts of the sac wall, aided by the action of the tendon, for, as Koenig has shown, in stiff joints the rice bodies do not occur.

¹ Virchow's Archiv, 1888, cxiv. 186.

² Neumann's (Königsberg) Archiv. f. mikros. Anat., 1880, xviii.

³ Loc. cit.

The tendon has been supposed to remain unaffected by the tubercular changes, but later examinations, and more especially the radical operations for tubercular teno-vaginitis, have shown that, though the tendon may be said to possess some immunity, it is at times affected. Tubercles have been seen in its tissue. At other times the tendon is so changed, that under a stream of water coming from an irrigator, it breaks up into bundles of fine fibres.¹

Further, the softening process which may occur in the fungous variety, causing pointing and the discharge of pus and cheesy material, leads, if not operated upon, to a death of the tendon, due, in all probability, mainly to the suppuration, but aided perhaps by a tubercular affection of the tendon.

DIAGNOSIS.—The hygroma form has certain well-marked characteristics which generally enable a diagnosis to be made with ease. Its chronic course, localization, bilocular, or hour-glass form, the soft crepitation and distinct fluctuation, and finally, on puncture, the escape of the rice bodies, which renders the diagnosis absolute.

The fungous variety, in both its circumscribed and diffuse forms, and especially the former, offers much more difficulty.

In the diffuse form the elongated, sausage-like, semi-fluctuating tumor confined to the anatomical limits of the affected tendon-sheath are the characteristics on which the diagnosis must be based.

In the circumscribed form we have more especially to exclude other tumors of the tendon-sheaths, such as gummata, lipomata, fibromata, etc., and often an incision alone can decide.

Between tubercular teno-vaginitis and true ganglion there ought not to be much, if any, difficulty in making the differential diagnosis, except when the ganglion occupies an unusual position; in this case puncture would settle the question.

TREATMENT.—The treatment of primary tubercular teno-vaginitis will alone be considered, as the secondary is rarely treated for itself alone, but depends upon the form of treatment adopted for the affected bone or joint.

The *hygroma form* (*hygroma proliferum*) was, and still is by many, treated by the application of irritants and mercurials to the overlying skin. Since the affection is now known to be tubercular in character we can readily understand the impotency of these methods.

More radical means, such as puncture, incision, the seton, and dissecting out the sac, were much feared, for the suppuration which was sure to follow some of these procedures, and might result from the others, was frequently phlegmonous in character, and amputation became too often the only hope of saving life.

¹ Falkson : loc. cit.

Thus Velpeau¹ says that synovial tumors developing on the tendons are quite dangerous. Jules Cloquet² says ganglia of the wrist and palm of the hand are not to be opened, on account of the danger of suppuration, gangrene, and death. Even as late as 1871 we find Frank Hamilton,³ after a series of unfortunate cases, advising against operation.

The non-operative methods of treatment may first be considered. The first method, if it can be called a method, is doing nothing. Here the question arises, Does this form of tubercular teno-vaginitis ever undergo spontaneous cure? Reasoning from what is known of tuberculosis in general, and more especially from tuberculosis of the joints, where a similar form of disease exists, one might suppose, since the joint affections not so very rarely recover of themselves, that, at least now and then, a similar affection of the tendon-sheath might get well. But as no cure by this means is reported, we must doubt if such a thing does in reality occur. The natural tendency of tubercular affections of the tendon-sheaths seems to be, slowly but surely, from bad to worse.

Whether this tendency may not be due to a variety of local conditions, proximity to the skin covering, thinness of the sheath walls, and the free and almost constant motion of the tendon, is not known, but seems not improbable. The usual course of a neglected case of hygroma proliferum tuberculosum is, that after a time, generally years, the skin at some point over the swelling grows thin, glossy, and slightly reddened, and finally ulcerates, discharging the contents, which are usually more or less purulent and contain rice bodies. This may result in a cure, but generally starts up such an active inflammation that an operation of some kind or other is necessitated.

The other forms of non-operative treatment have for us to-day but little interest, because we know their worth. Such are the application of heat and cold, painting with iodine, mercurial ointment, marjoram oil. Caustics and the seton seem to have been but little used, probably owing to the bad results which must have attended their application. Indeed, no case could be found which had been treated by the seton, though it was recommended by Christopher Heath,⁴ and but one on which caustics were employed, that of Edward Daniell.⁵ "A case of ganglionic deposits situated on the tendons of the flexors of the forearm, within and upon the palmar arch." Potassa fusa was employed, and it was thought that some forty cysts were removed. The result, beyond a statement that the wound healed, is not given.

Puncture, and later aspiration, were naturally the first operative procedures; made with antiseptic precautions they are to-day without danger, and even in the pre-antiseptic period their danger, like that of

¹ Loc. cit.² Loc. cit.³ Med. Rec., N. Y., 1871, vi. 9.⁴ Brit. Med. Journ., 1871, ii. 9-36, etc.⁵ Ibid., 1858, 884.

other subcutaneous operations, was much less than that attending free incision.

To this form of treatment was usually added the injection of an irritant, commonly iodine tincture, very recently the emulsion of iodoform in glycerine, Garré.¹

Good results, cures, are reported by the aspiration and iodine injection methods by Burnett,² Gooch,³ v. Mosengeil⁴—a case where simple aspiration repeated once was supposed to have performed a cure (?)—Spence,⁵ Skey,⁶ Wright.⁷

Free incision, with or without division of the annular ligament, Syme's operation,⁸ followed by drainage, was a much used method, and undoubtedly gave good results. Garré (*loc. cit.*) in speaking of the final results of this method, says the majority of the cases suffer a recurrence, either in the form of hygroma or fungus; another part of the cases die of other tubercular affections, while a third part remain well for from six to ten years. These latter cases he compares to tuberculosis of the peritoneum, where, as is known, simple incision may cause the cure.

Quite a favorite method of operating was to make two free incisions, one above, the other below the annular ligament, by this means through drainage being practicable; of late years this method has been enlarged by the addition of curetting the sac walls, that portion of the sac immediately beneath the annular ligament being scraped by means of a drainage-tube passed beneath the ligament, the scraping being effected by the holes in the rubber tube as it is drawn back and forth. See Warner,⁹ Willet,¹⁰ Campbell de Morgan,¹¹ Lees,¹² Ormsby,¹³ Wright,¹⁴ Rouse,¹⁵ Copeland,¹⁶ Donald Maclean,¹⁷ Berger,¹⁸ Falkson,¹⁹ Puzy,²⁰ Stanley.²¹

The remaining operation, that of a truly radical removal of all the tuberculous material, though by no means new, for it is referred to by Jules Cloquet, is one which has been rendered justifiable by the anti-septic and aseptic methods of operating.

¹ Deutsch. med. Zeitg., April 24, 1890; or Abh. d. 9. Cong. Deutsch. Gesellsch. f. Chirurg., Berlin, 1890.

² Dublin Journ. Med. Sci., 1877, lxiv. 261.

³ Ibid.; Jules Cloquet (*loc. cit.*)

⁴ Archiv. f. klin. Chirurg., 1870, xii. 71.

⁵ Brit. Med. Journ., 1871, ii. 9, 36, etc.

⁶ Lancet, London, 1870, ii. 285.

⁷ Med. and Surg. Reporter, Phila., 1881, xlv. 676.

⁸ Practice of Surgery, 1866, 283.

⁹ Jules Cloquet, *loc. cit.*

¹⁰ Brit. Med. Journ., 1871, ii. 9, 36.

¹¹ Ibid.

¹² Ibid.

¹³ Med. Press and Circular, 1881, xxxii. 26.

¹⁴ *Loc. cit.*

¹⁵ St. George's Hospital Reports, 1879, ix. 333.

¹⁶ Am. Journ. Med. Sci., 1881, 143.

¹⁷ Trans. Am. Surg. Assoc., 1884, ii. 521.

¹⁸ Deutsch. Zeitschr. f. Chirurg., xxi. 1885, 335.

¹⁹ Arch. klin. Chirurg., xxxii. 1885, 38.

²⁰ Lancet, London, 1886, ii. 1074.

²¹ Med. Times. London, 1852, n. s., v. 262.

The operation is very simple in its description but tedious and difficult to perform. The sac is laid open, split from end to end, then with the forceps and curved scissors the affected membrane is dissected off. Iodoform, drainage and bandage. The results are good. See Beatson,¹ Cloquet,² Howse,³ Gerster,⁴ Weinlechner,⁵ Bond,⁶ Golding Bird,⁷ Berger,⁸ Falkson,⁹ Garré.¹⁰ As to the *treatment of the fungous variety*, both diffuse and circumscribed, what has been said of the methods of treating the hygroma form holds true—that is, with certain limitations, for, owing to the nature of the tumor, puncture, aspiration, and simple incision are here not applicable. So, after the use of topical applications, the next step is to the removal of the growth, hence, probably, the “*noli me tangere*” reputation these tumors have enjoyed.

Of operations for the removal of the fungus but two are used, the curetting and the excision. The formal excision can but appeal to every surgeon as being much more likely to remove all, every trace, of the tuberculous material. It has been urged by Garré (*loc. cit.*) that the fungus is too tough and fibrinous to be either easily or successfully removed with a sharp spoon; whereas the enucleation is not difficult, and the tendon can almost invariably be saved. Garré (*loc. cit.*) had operated upon nine cases with the best results; in some there had been no return after seven years. See Doyen,¹¹ Beach,¹² Symonds,¹³ Golding Bird, Berger, Falkson, Koenig, Volkmann (*loc. cit.*).

NOTE.—Since the writing of the paper, January, 1891, there has appeared, in the *Beitr. z. klin. Chir.*, Tübingen, 1890–91, vii. 293, an article by Prof. Garré, on the primary tubercular inflammation of the tendon-sheaths, in which some forty cases are reported.

In August, 1891, while on duty for Dr. Ransohoff, at the Cincinnati Hospital, it was my good fortune to have the opportunity of operating upon a case of the fungous variety affecting the extensor tendons of the right wrist of a colored girl, aged seven years. The growth was excised, and with it the posterior ligament of the wrist, which also had become involved, though the joint itself was healthy, and the tendons cleaned; continuous suture; no drainage; first bandage changed in fourteen days; result perfect.

¹ Journ. Anat. and Phys., 1879, xiii. 449.

² Brit. Med. Journ. 1879, ii. 9, 36, etc.

³ Loc. cit.

⁴ Med. Rec., N. Y., 1887, xxxi. 277.

⁵ Ber. d. k.-k. allg. Krankh., Wien, 1888, 232.

⁶ Practitioner, 1890, xlv. 440.

⁷ Trans. Path. Soc. London, 1889, xl. 244.

⁸ Loc. cit.

⁹ Loc. cit.

¹⁰ Loc. cit.

¹¹ Prog. Méd., Paris, 1883, xi. 394.

¹² Boston Med. and Surg. Journ., cxx. 559.

¹³ Trans. Path. Soc. London, 1887, xxxix. 447.

LEAD-POISONING WITH SPECIAL REFERENCE TO THE SPINAL CORD AND PERIPHERAL NERVE LESIONS.

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IN recording this case, I do so with the object of adding to the testimony already collected in support of the general rather than the local affection of the nervous system by lead-poisoning.

Many cases have now been recorded in which microscopical investigation has revealed that the central nervous system is involved, as well as the peripheral nerves.

The question as to whether the former is secondary to the latter, is still unanswered.

Those favoring the central disease as the primary cause of the peripheral lesions, claim that disease of the anterior gray matter of the cord exists, although not apparent to our present modes of examination.

It would, however, seem reasonable to suppose, as Pal has suggested, in his monograph on multiple neuritis, that toxic agents such as lead, alcohol, arsenic, etc., act simultaneously on the whole nervous system, especially involving, perhaps, the peripheral nerves, but also involving the central nervous system.

In such cases, however, where recovery does not take place early in the disease, that is, in those pursuing a chronic course, or when the toxic agent is still in force, it would appear that the central nervous system becomes affected, and its disease manifests itself in well-recognized organic and systemic diseases.

This explanation would seem to accord with the clinical history of many of the cases of multiple neuritis, especially of alcoholic origin, when so-called pseudo-tabes and psychical derangement are prominent symptoms.

A basis for this permanent condition is not infrequently found outside of the peripheral nerves in disease of the meninges and substance of the brain and cord.

Present investigation would indeed seem to show that disease strictly limited to certain systemic tracts, so called, is rarer than formerly supposed, and that a diffuse affection of various columns and of various areas is common. This would seem also the more reasonable, as clinically, even in such a frequently observed and familiar organic disease as tabes, many symptoms are either absent, which are considered diagnostic of the disease, or again, others are present which are directly opposed to the situation of the lesion in the posterior columns. There has never been any

¹ Read before the American Neurological Association at its annual meeting, Washington, September 8, 1891.

satisfactory explanation, to my mind, of the selection of certain tracts with limitation to their sole environment by disease of infectious or toxic nature. The common selection of the upper extremities, as the seat of disease in lead-poisoning, and especially of the extensor group of muscles of the forearm, and those of the hand, may possibly be explained on the ground that those muscles are especially exposed to over-use.

I have observed that those cases of lead-poisoning more strictly limited to the muscles of the hands, resembling in its distribution that of progressive muscular atrophy, are usually difficult of cure, if indeed much improvement takes place at all. I have considered that in these cases, a spiral lesion involving the anterior horns was probably present, although hitherto unable to support the theory by autopsy.

The present case, which I now present, was of that nature, and the findings would seem to support my clinical deduction. In lead-poisoning, however, we do not always find the paralysis limited to the upper extremity. The lower extremities may be affected, or the paralysis may be hemiplegic in its distribution. Buzzard, in his work on *Disease of the Nervous System*, Lect. XXV., on "Some Points in the Diagnosis of Lead Palsy," relates :

A woman, aged twenty-five years, had paralysis of the forearm and hand muscles of the right side, and of those of the leg of the left side, with foot-drop. There was loss of faradic response, and a reaction of degeneration to galvanism; the left forearm also showed less response to faradism than normal, although no paralysis had been demonstrated. The case ended in recovery.

In a second case, also a woman, with paralysis of all the extremities, there was loss of patellar reflex, and loss of reaction to both faradism and galvanism.

A third case, a sign-painter exposed to lead, and exhibiting the blue line (although not a very characteristic one), presented at first a weakness of the left forearm and both legs, and later, of the right forearm, although the right side showed no perceptible alteration. There was also wasting of the interossei of the left hand. There was loss of excitability to faradism in the wasted muscles, and in the supinators. (From this latter fact, Dr. Buzzard mainly makes the diagnosis of progressive muscular atrophy.) The autopsy revealed "extensive atrophy of the large ganglionic cells in the anterior horns (more marked on one side than the other), in the cervical and dorso-lumbar regions, together with what was apparently a commencing overgrowth of connective tissue in the lateral columns.

I have related the last case quoted from Dr. Buzzard rather fully, as in many respects it resembles my own, and as supporting the theory of the affection of the central nervous system in lead-poisoning. The etiology in this case I would ascribe to lead, and would therefore differ from the author as to the diagnosis.

I will briefly give the history of the case on which I have based this paper :

A. E., painter, first seen June, 1890. Family history negative. *Previous history:* He has worked at his trade since the age of thirteen ;

when twenty-one he had an attack of painter's colic, with some weakness of the arms. Two years later he had a second attack, since which time there have been several mild attacks. For the past two years he has become progressively weaker in his hands, which have become wasted, so that he is unable to hold his brush. Three months ago, he had an epileptic seizure, in which he lost consciousness, and was taken to Bellevue Hospital. He remained there for three months, and improved but slightly.

Present condition: Patient anæmic, and sallow. Complaints of weakness in both forearms and hands, especially of the latter, which present the appearance seen in progressive muscular atrophy. Heart hypertrophied; radial arteries, as also the temporals, show high tension. Eyesight poor; patient is unable to read well unless with a bright light. Ophthalmoscopic examination by Dr. C. S. Bull showed the following: R. E., 20/xxx; L. E., 20/c; irregular hemianopsia, the nasal half of the field being intact. R. E.: Exudative neuro-retinitis, with intense exudation over the disc and neighboring portions of the retina. L. E.: Atrophy of the optic nerve and retina, with occlusion of some of the vessels. Suspected degenerative nephritis. Examination showed marked loss of power in both forearms and hands, more marked on the right side. Great atrophy of the interossei, and of the muscles of the ball of the thumbs. Grasp feeble; no tremor; able to extend the hand with great difficulty. Sensation lowered to heat and cold, and to touch and pain, and, to a slight degree, to the faradic current. Electrical examination: The extensors of the forearm show excitability to the faradic current, but much reduced. Supinators unaffected. Muscles of the hands, the interossei and opponens pollicis show no response to faradism. There was a loss of excitability to galvanism, but no reaction of degeneration. There was no affection of the lower extremities, nor was there rectal or vesical paralysis. Reflexes were normal; no pain on pressure along the course of the nerve or in the muscles. Urine: sp. gr. 1008; albumin.

He was put on potass. iodid. and iron, with galvanism, three times a week.

There was no change in the condition of the muscles during the following ten months, either in power, or in response to the electrical currents; but as the Bright's disease progressed, he entered Bellevue Hospital again, where he died, March, 1891.

Autopsy.—Heart hypertrophied; lungs normal; kidneys the seat of interstitial nephritis; brain normal, except that the arteries were the seat of atheromatous changes. The cord, including the cervical and upper dorsal portions, and the musculo-spiral nerve were hardened in Müller's fluid, and examined microscopically by Dr. W. Coleman, of the Loomis Laboratory. The peripheral nerves were markedly degenerated. The cord at the upper dorsal region showed some atrophy of the anterior horns, especially of one side, and also of the antero-lateral tracts of that side. In certain levels, there was evident sclerosis of the column of Goll, and also in Lissauer's tract there was thickening of the meninges and of the bloodvessels. In the substance of the left anterior cornua there was an apparent breaking down, leading to loss of substance. This was probably increased artificially in the examination. The anterior nerve roots also showed degeneration. While these changes are not extensive, still the evidence is clear, of a slow, progressive, degenerative process.

We have, then, changes indicative of sclerosis, disseminated in character. The whole body was evidently the seat of like changes, as shown in the arteries and kidneys.

This case is somewhat similar to the one recorded by Pal, both in its history and microscopical findings—see his monograph on *Multiple Neuritis*.

CASE IV. The patient, aged twenty-one years, showed in his first attack, colic and convulsion. A transient paralysis of the right abducens and facial, and later, of the left side. Papillitis on both sides. Hemorrhage in the right eye, the vessels, especially the veins, being strangulated. Patient could distinguish light from darkness; upper extremities ataxic and weak; lower extremities, atrophic; patellar reflex absent. Sensibility reduced.

Autopsy.—Showed partial degeneration in the optic, oculo-motor, abducens, facial, right radial, and left peroneal. The cord showed degeneration of the white columns of a disseminated character, as also of some of the cells in the anterior horn, and the posterior nerve roots.

In conclusion, if I understand the author correctly, he finds in his case a disseminated sclerosis, all the tracts of the cord being affected in different areas, and from this, and other cases, he holds that multiple neuritis affects the nerves in the tract of the cord in the same manner as it does the peripheral nerves.

From the literature of the subject (for reference to which I would refer again to Dr. Pal's monograph), and from the case I have referred to, it is evident that the various toxic agents, as arsenic, lead, alcohol, etc., cause multiple neuritis, involving at times the upper and lower extremities, although with each individual agent certain regions are more often selected; and also that with the peripheral lesion there is not infrequently associated organic lesions of the central nervous system.

The frequent association of cranial nerve lesions in lead-poisoning, as well as from other toxic agents in which we find changes in the nerves or their nuclei, should have prepared us to expect like lesions in the gray matter of the cord, and as these paralyzes sometimes occur with disease of the nerve alone without the involvement of the nuclei, so, to carry out the analogy, it would seem impossible for it to be otherwise in the relation of the peripheral nerves to the spinal cord.

An interesting question is suggested by Pal in reference to the trophic dependence of the motor spinal nerves to the cells of the anterior horns. He finds that in some cases of atrophy of the cells, no degeneration of the nerve fibre followed. The subject would lead me into a discussion of poliomyelitis, which has already occupied considerable of the time of the session, and therefore I will only say that this sustains again the fact of the simultaneous affection of the peripheral and central nerves as well as their individual, and, at times, exclusive disease.

IMMUNITY FROM PHTHISIS AS AFFECTED BY ALTITUDE
IN COLORADO.BY C. F. GARDINER, M.D.,
OF COLORADO SPRINGS.

IN the climatic treatment of pulmonary phthisis, altitude, combined with sunshine and a minimum rainfall, undoubtedly to-day holds the first place, and in the average cases of phthisis offers the best chances of recovery. The immunity from phthisis which these climatic conditions confer upon the inhabitants of such regions, and the death-rate from phthisis, as compared with communities at low elevations, as on our seacoast, etc., must bear a direct relation to the value of this climate in the treatment and cure of the phthisical. In collecting for comparison cases of phthisis at an altitude which have developed there, care must be taken not to include cases that came to the country with symptoms of the disease; cases should be taken which have lived at least several months in fair health under these climatic conditions before developing phthisis.

It was at one time supposed that a race who lived at and over 6000 feet altitude, such as Colorado, the Mexican Plateau, Valley of the Andes, and similar elevations elsewhere, never did develop phthisis unless they removed to a lower altitude, one writer even going so far as to limit the non-phthisical line at a certain altitude (Kuchenmeister).

As regards the highlands of the United States, this was no doubt true in the past, as, until within a very few years, our whole country—in the West at least—was very thinly settled and the only statistics we had were from army surgeons, and their experience was largely confined to observation upon the natives or white men who, like most pioneers, were above the average physically, and, in addition, lived a vigorous outdoor existence—a life that would confer immunity from phthisis in far less favored regions. As time has gone on, however, towns have sprung up all over our dry and elevated regions. Sedentary occupations have replaced outdoor ones, and the crowding of towns and villages has taken the place of the scattered camp of the cowboy and hunter, and, as a consequence, non-imported phthisis is not now an unheard-of thing.

In taking statistics from a town as a standard of comparison, it was thought that the result would be more useful than reports from a large section of country, as the condition of a town regarding occupations, manner of life, etc., would more closely approximate to conditions of towns at low altitudes, than would a comparison between agricultural or country life in different sections—as, for instance, the life of Colorado ranchmen differs materially from that of a New England farmer. These statistics have been taken from Colorado Springs, a town situated at an

altitude of 6000 feet, with a sandy soil, good natural drainage, rainfall of about 15 inches per annum, with a mean relative humidity of 51. The streets are broad, well planted with trees, and the dwellings as a rule are not built into blocks.

Certain conditions, however, favor direct phthysical contagion, as in many instances the inhabitants are either phthysical or have recovered from phthisis, or at least have a marked phthysical family history, thus making the town, as a community, most liable to phthisis from a standpoint of hereditary influence and direct contagion. The well ones are frequently closely confined with the sick, with the attendant anxiety, work, and worry, and there are many houses in which numbers of people have died from phthisis. From the dryness of the air there is a fair quantity of dust distributed by the wind in the streets, and there is no doubt that any precautions regarding dried sputa are confined to the exceptionally intelligent minority.

To balance these dangers there is, of course, first, the physiological effect of the climate as an antidote and direct tonic, the clear weather which encourages life out of doors, the sandy soil, and the increased diathermancy of the atmosphere and almost constant sunshine, which possibly act in that way as a germ-destroyer far more vigorously than in humid climates. Koch is quoted as saying that tubercle bacilli are killed by direct sunlight in a pure culture.¹

But, taken merely as a town, apart from any immunity due to climatic conditions, there is no doubt that, as a community, the town, from the very nature of the inhabitants, is most eminently calculated to spread the seeds of consumption broadcast; and, if the bacteriologist is right, and consumption is spread from the sick to the well by the means of dried tubercular sputa, then this town ought to show a large number of primary cases of phthisis annually, or else there is some powerful agent at work preventing infection, due to the climate. If the same conditions for infection existed in a town at a lower level, as on the seacoast or inland rivers, and phthysical affection did not occur much more frequently there than in the average town, then contagion from phthisis would be considered a myth and not worth considering.

The following cases have been collected from the physicians of Colorado Springs. In each case the evidence has been carefully sifted, and, in every instance, the physician who treated the case has been personally interviewed in regard to it. The relatives of many of the patients have also been cross-examined. In some of the cases several physicians saw and treated the patient, and it is needless to remark that, in a resort for consumptives, the physicians are specially trained

¹ "Observations on Tuberculosis and the Diagnostic Value of Tubercle Bacillus," by Henry Sewall, M.D., Ph.D., Denver, Col. Medical News, July 25, 1891.

in the diagnosis of phthisis, and a primary case excites great interest from its rarity. The histories are far from perfect, being, in several cases, entirely supplied from memory, and, with one exception, there was no sputa examination made—in fact, the majority of the cases occurred before this was generally used as an aid to diagnosis; but, even with these drawbacks, they are certainly as accurate as the average statistics, if not more so.

The cases cover a period of about fifteen years. The town in 1875 had nearly 3000 inhabitants, which increased steadily until 1884–85, when there was a sudden increase in population of about 20 per cent. In 1890 there were 12,000 inhabitants.

CASE I.—Male, aged thirty years; strong physique; had lived in Colorado Springs eight years; occupation, private secretary, but in this occupation was often half of his time out of doors; no family history of phthisis whatever, and, as far as was known, was not exposed in any way to direct contagion, being a large part of his time in the outskirts of the town proper. Symptoms came on slowly; thought he was bilious; loss of appetite; dyspepsia; some loss of flesh; slight cough; no fever. Physical examination: On left third interspace had aërial or bronchial respiration, whispering bronchophony, and below on this side an area of coarse râles; heart normal. Ten months later owing to a fire in the house in which he lived, he became excited, over-exerted himself, and had a profuse pulmonary hemorrhage. Not improving in Colorado, and thinking a complete change might be of benefit, he spent the winter in the West India Islands, and was somewhat improved, but, upon his return in the spring to Chicago, had a sudden and violent pulmonary hemorrhage, which was fatal, some three years after first symptoms of disease appeared (1889).

CASE II.—Male, aged twenty-two years; fair physique; had lived in Colorado Springs one year; occupation practically a cowboy; had a marked phthisical family history, one sister having died in Colorado Springs of the disease. While riding, he was thrown violently from a horse, which resulted at once in a profuse pulmonary hemorrhage, and he died of acute phthisis after a few months, in 1882.

CASE III.—Woman, aged twenty-eight years; strong physique; Irish; had lived in Colorado Springs three and a half years; family history unknown; no case of phthisis in the house in which she worked. Was taken with an obstinate cough; had moist râles at left upper apex, and the disease gradually extended through left lung and into other lung; she, in the meantime, bore one child; had puerperal fever, and, at a later date, typhoid fever, there being some uncertainty regarding the latter, as to whether it was acute tuberculosis or typhoid fever; she finally died of acute phthisis two years after first symptoms had appeared; no hemorrhage (1886).

CASE IV.—Male, aged thirty years; good physique; had lived for two years in Colorado Springs; occupation, harness maker; family history unknown. First had a case of typhoid fever; convalescence was tedious, and he began working at his trade in a weak condition, working in a small, badly ventilated room with five other men; he slept in the same room at night; developed a hacking cough; loss of flesh and

strength; had râles over both apices. He went to California and lived there several months; came back to Colorado worse than before he left; then he finally returned to his home in Pennsylvania; result unknown; no hemorrhage (1882).

CASE V.—Male, about thirty-five years old; family history unknown; good physique; Irish; had lived in Colorado Springs three or four years; occupation, day laborer; lived in a very bad hygienic condition, in small room badly ventilated, and had poor food. Developed a hard cough, with profuse expectoration, with mucous and subcrepitant râles over both lungs. Had fever and loss of weight. He in a few months left Colorado Springs, with the disease progressing rapidly; he had no hemorrhages; further history unknown (1885).

CASE VI.—Male, aged twenty-two years; good physique; residence in Colorado Springs fifteen years; occupation, clerk in drygoods store; had a strong family history of phthisis, one sister having died of the disease in Colorado Springs. He was a member of the volunteer fire company, ran numerous foot-races, and while training for the latter broke down and developed phthisis; physician in charge said it was a typical case of the disease, but had no notes to refer to; death occurred after about three years from the time first symptoms occurred; no hemorrhages (1887).

CASE VII.—Male, aged twenty-one years; fair physique; cousin of the above; family history of phthisis (mother died of the disease in Colorado Springs in 1882); had lived in Colorado Springs fifteen years; occupation, clerk in gentlemen's furnishing store. Was a member of the volunteer fire company; developed phthisis gradually and was sick, in all, two years; during the last three months intestinal tuberculosis was present; had no pulmonary hemorrhages (1889).

CASE VIII.—Male, aged twenty-two years; good physique; family history unknown; had lived in Colorado Springs ten years; occupation, printer. Was a member of the volunteer fire company; developed symptoms of phthisis gradually, and, after two years, died in 1890; no hemorrhages.

CASE IX.—Female, aged twelve years; had lived in Colorado Springs five years; family history unknown; ran down, with cough, fever, and loss of flesh; an area of consolidation over left lung anteriorly; moist râles over the rest of this lung; this continued for nearly a year, when gradually complete recovery took place; no hemorrhages (1886).

CASE X.—Female, aged thirty years; good physique; residence in Colorado eighteen years; no occupation; family history phthisical; grandmother, father, and two aunts had phthisis. She first had a walking case of typhoid fever in 1888; later, in March, of the same year she began to lose flesh and appetite, with a temperature of 101°. Physical examination: Dulness over three-fourths of the upper left lung anteriorly and posteriorly; expectoration scanty; mucoid in character; was not streaked with blood; for six to eight weeks there was progressive consolidation of left lung; then the condition was slightly better for a time, but in August 1889 the whole lung became involved and the right lung also became diseased; the sputa was crowded with tubercular bacilli, and death took place late in 1890, with fever, emaciation, diarrhœa, etc.; the patient had never been out of Colorado Springs or El Paso County for eighteen years, and was in excellent health until

1888; her father died in Colorado Springs in 1887 of tubercular laryngitis.

None of the above cases, as far as known, had been away from Colorado for several months prior to developing the first symptoms of the disease, and the majority had certainly never been lower than 5000 feet altitude since coming to Colorado.

It is nearly impossible to draw any relation between these cases and the population of Colorado Springs, as we are dealing with a phthysical community, and do not know with any certainty the exact proportion between the phthysical and non-phthysical. In regard to the relations between altitude, population, and phthisis, Hirsch, in his *Historisch-geographischen Pathologie*, gives some interesting statistics quoted from Corval, in the Grand Duchy of Baden. The mortality from phthisis in the towns increased in proportion to the number of inhabitants. He divides them into groups:

Group No. 1. Towns of 330 to 1000 feet altitude, average mortality from phthisis, 3.36; mortality in villages of less than 3000 population, 3.11; with over 3000, 4.5.

Group No. 2. Towns of 1000 to 1500 feet altitude, average mortality from phthisis, 2.75; towns of less than 3000 population, 2.73; more than 3000, 3.8.

Group No. 3. Towns of 1500 to 2000 feet altitude, average mortality from phthisis, 2.16; less than 3000 population, 2.49; more than 3000, 4.99.

Group No. 4. Towns of 2000 to 2500 feet altitude, average mortality from phthisis, 2.71; more than 3000 inhabitants, 4.72.

Group No. 5. Towns of 2500 to 3000 feet altitude, average mortality from phthisis, 2.31; less than 3000 inhabitants, 2.29; over 3000, 3.6.

Group No. 6. Towns over 3000 feet altitude, average mortality from phthisis, 2.17. All towns of this altitude were under 3000 inhabitants. Towns under 3000 inhabitants are freer from phthisis, it being a legitimate inference that in the smaller towns under 3000 inhabitants the occupations are more inclined to agriculture; in towns over 3000, to industrial occupations, with a proportionate increase of phthisis.

The endeavor has been made, even with the extremely limited facilities at command, to make at least a rough guess at the annual rate of mortality from phthisis among those of the inhabitants who did not come here for their own health and are practically non-phthysical. Those who have had phthisis and recovered are not included among these, but are classed as phthysical. One hundred and nine houses were selected at random, the inmates of which, amounting to 552 persons including servants and children, were known. The number embraced all stations of society, and included many different forms of sedentary and out-of-door occupa-

tions. The result showed one case of imported phthisis to every six healthy people. If this result is approximately true of the whole town, and we estimate an average population of 5000 people each year for fifteen years, after deducting the imported cases of phthisis from the population, we shall have an annual mortality from phthisis among the non phthisical of $\frac{1.3}{100}$ per 1000. The only basis of comparison I had being mortality statistics, I have considered all the ten cases in calculating the mortality, although, as a matter of fact, one recovered, and in two cases the result is unknown. But practically the result is the one desired, viz., the number of cases originating here. As compared to the $\frac{1.3}{100}$ per 1000 found here, the average elsewhere in all towns, cities, etc., is 3 per 1000. Even Switzerland, with the advantages of altitude and agricultural occupations, has a rate of $1\frac{8.6}{100}$ per 1000 originating there. Contagion certainly plays an important part in the transmission of phthisis. Cornet has shown that among the natives of Mentone there has been an increase of phthisis, due to the increase of consumptive patients who spend the winter there, and who thus transmit the disease to the peasants. W. H. Geddings, of Aiken, South Carolina, has reported cases of phthisis in women who wash clothes (more especially handkerchiefs) of those suffering from consumption. Tindal, in an article in the *Fortnightly Review*, September, 1891, mentions a clear case of contagion from father to daughter occurring in the country in Switzerland. Both inhabited the same room. The father expectorated on the floor, from which, when brushed by the girl, clouds of dust were raised. When first seen, the girl was a fine specimen of health. One year later she developed the disease and was the first to succumb.

Conditions like the above certainly have occurred again and again among the non-imported cases here reported in Colorado Springs, and yet it is a peculiar fact that, with one exception, not one of the ten cases here reported was exposed to phthisical contagion, nor, as far as can be ascertained, lived with anyone with phthisis, or had lived with or nursed anyone sick with that disease for a long time before developing phthisis; not one had an occupation that brought him in contact with the sick—facts in striking contrast to the history of most of the healthy people of this community. It is only fair to note in this connection that my figures have been based upon a population that is more or less a transient one, and possibly some exposed to contagion have developed the disease after leaving here, especially as there seems to be reason to believe that in some cases the disease may lie dormant for possibly months without symptoms. The conclusion drawn, however, is that this climate decidedly modifies contagion, and does so far more thoroughly and effectively than statistics show to be true of any other climatic resort, at least as far as I have been able to ascertain.

METAL-TURNERS' PARALYSIS.

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AND

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THE attention of the writers was called to the form of paralysis for which the above title suggests itself by a case of recent origin, seen by both after having been referred to the former by Dr. Hooker, of Springfield. The case seemed not to fall under any recognized type, although the region invaded was that of the ulnar nerve, and the position of the hand that of ulnar paralysis. The uncertainty regarding the origin and prognosis of the trouble was dissipated by the history of a second case, seen shortly afterward by both the writers, in the Neurological Department of the Massachusetts General Hospital, to which he applied for treatment. This recalled a former similar case, treated in the same department, concerning which some doubt had existed at the time of his admission. All three of these patients being brass-workers, it seemed probable that the nature of the employment was to blame for the trouble. The disorder consists, briefly, in complete atrophy of the muscles of the left hand supplied by the ulnar nerve, with very slight sensory disturbance (numbness) and slight dull pain and tenderness over the ulnar nerve, the pathological process being probably neuritic, though of a somewhat peculiar type. The practical point for the clinician is the distinction between this disorder and progressive muscular atrophy, as the second case we have to report shows a standstill for fifteen years, the maximum of the disturbance having been reached in four months after the onset.

CASE I.—This was the case of a young man who had been a brass-worker for a number of years, but who had discontinued this occupation on account of the disability for which he consulted Dr. Hooker, who naturally feared progressive muscular atrophy. Four months before coming to Boston he noticed a recurrent numbness in the little finger of the left hand, principally subjective, and lasting a day or two at a time. This finally became continuous and affected all the fingers of the left hand. There was no paræsthesia. There followed awkwardness in using the hand, and weakness, which caused him to leave off work one month ago. There has been no pain, excepting occasionally a dull ache in the forearm. The right hand is unaffected.

Physical examination shows that a light touch is not felt on the little and ring fingers, both sides of the ring finger being affected, though the

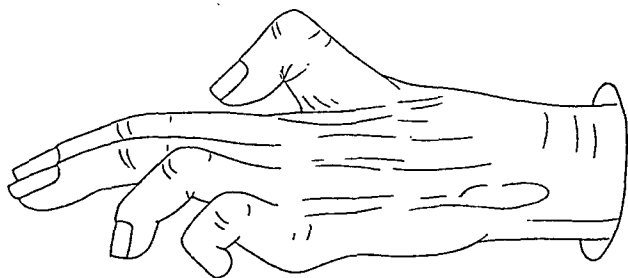
ulnar side is more markedly so. The little and ring fingers are drawn up, the index and middle fingers comparatively straight. The interossei and thenar muscles are wasted. The thumb is fixed in a position of flexion, although some flexion is possible and opposition is unaffected. Adduction is impossible. Flexion and extension of the fingers and wrist are unaffected. The interossei and thenar muscles show no reaction to faradism or galvanism. There is no fibrillary twitching, and no history of this symptom having existed. There is a slight tenderness over the ulnar nerve at the elbow.

A diagnosis of probable neuritis was made, and a guarded prognosis given as regards recovery; but the chances were stated to be against progression, though not with confidence, on account of the resemblance of the case to progressive muscular atrophy. The patient was put upon *nux vomica*, and galvanism was applied. The treatment was discontinued, however, on account of the disappearance of the patient.

The second case was seen not long after, and its duration seemed to establish the prognosis of these cases with sufficient certainty to render this contribution a practical one to the clinician, in one respect at least.

CASE II.—M. O'D., about sixty years of age, was referred to the Neurological Department of the Massachusetts General Hospital, where he was seen by both the writers. He has worked in brass thirty-eight years, at an average of ten hours a day, having been employed most of the time at the lathe, although he has also been out jobbing.

He first noticed the trouble fifteen years ago; it reached its maximum in four months, and has remained stationary ever since. He first noticed difficulty in using the thumb of the left hand; then the ring and little fingers became bent, and could not be straightened. At first there was a slight pricking and tingling in the little finger and a dull ache and tired feeling in the ulnar side of the forearm. The latter sensation has persisted up to the present time, although the paræsthesia has disappeared.



Examination shows a slight tenderness over the ulnar nerve at the elbow, pressure upon which point sends a pricking into the little finger. The lightest touch is everywhere felt, though the sensation produced seems to him a little unnatural—"tingly"—over the region supplied by the ulnar nerve. All the interossei and thenar muscles are atrophied, and have lost electrical excitability, excepting that of the *opponens pollicis*. The *hypothenar* muscles are wasted, and have lost their electrical excitability. The little and ring fingers are in a state of flexure, most

marked in the little finger. The first and middle fingers are comparatively straight, though they cannot be moved from side to side by the interossei. Flexion and opposition are the only movements possible in the thumb.

The accompanying illustration, drawn from the second case, represents fairly the left hand in each of these cases, and is seen to be practically that of ulnar paralysis. No treatment was advised, on account of the long standing of the case.

It would seem that these cases fall rather under the head of neuritis than under any other class.

The first of the two patients worked almost altogether at the lathe, and the second worked there a great part of the time, though he also did jobbing work outside.

Judging by the constrained position of the left hand in using the lathe, as illustrated by both patients, it seems probable that this is the part of the work at fault. It is certainly improbable that the metal worked upon has any bearing upon this affection in a toxic manner, especially as the trouble is purely limited to the left hand. Whether the fault lies simply in overstrain of the interossei and lumbricales or in neuritis set up by the muscular pressure exercised on the ulnar nerve when put upon the stretch by the flexion of the elbow, it is hard to say. If the former alone, it would seem that all should be affected and the hand assume rather the typical claw shape common in progressive muscular atrophy, instead of the first two fingers being straight, as in ulnar paralysis, through the exemption of the first two lumbricales, supplied by the median. The atrophy is too marked to admit of its classification under occupation neuroses. Its course would seem to be to reach a maximum in about four months, but to progress no further.

Whether this affection is allied to the multiple neuritis (probably toxic) among brass-workers, reported by Suckling,¹ is questionable.

THREE CASES OF TRAUMATIC HYSTERICAL PARALYSIS, OF TWENTY-NINE, TWENTY-EIGHT, AND TWENTY-NINE YEARS' DURATION RESPECTIVELY IN MALES.

A CONTRIBUTION TO THE PROGNOSIS IN TRAUMATIC NEUROSES.

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HOWEVER much opinions may differ amongst neurologists regarding the nature of traumatic neuroses, still greater difference of opinion exists concerning the prognosis in such affections. While some believe that

¹ British Medical Journal, December 15, 1888.

the tendency of all cases is toward recovery, and that the great majority do recover at a comparatively early period after the cessation of unfavorable surrounding influences, such as litigation, others maintain that the tendency of the affection is in the opposite direction, and that the pathological condition disappears, if at all, only after a prolonged existence.

I therefore wish to put on record three cases, two of which have already persisted twenty-nine years, and one twenty-eight years, as instances of the extreme length of time that such disabilities may persist, and that without obvious external cause therefor. These cases are the more remarkable because they belong to the so-called hysterical type, are of the male sex, and have, so far as can be judged, maintained their original form without the development of secondary pathological conditions.

One of them is an example of hysterical hemianæsthesia and hemiplegia, and two are instances of monoplegia.

I have already reported,¹ in conjunction with Dr. John C. Blake, a case of hysterical monoplegia of very severe type, which recovered about three months after the conclusion of the suit for damages, and which, therefore, represented the other extreme, or the possibility of rapid recovery.

The notes in two of the three cases are not as full as is desirable, but, nevertheless, I think I am justified in saying that, notwithstanding the incompleteness of the records, the cases were examined with sufficient care and detail to put the diagnosis beyond reasonable doubt.

CASE I. Hemiplegia and hemianæsthesia of twenty-nine years' duration.—The patient was first examined May 12, 1886, and again five years later—March 11, 1891. The area and depth of the *anæsthesia* at the time of these two examinations showed marked differences. At the first examination the absolute loss of the sense of touch and of pain was limited to the left arm and leg. In the arm it extended from the hand upward to a limiting line as high as the middle of the upper arm, and in the leg as high as the middle of the thigh. Over the remainder of these limbs sensation was "somewhat" diminished only; over the body sensation was apparently normal—at least my notes do not mention any defect. At the second examination *anæsthesia* and *analgesia* had so far increased that it was absolute over the *whole left side*, with the exception of the face and palmar surface of the hand, where the defect was not absolute. The thermal sense was impaired over the same region. Over the scrotum and penis sensation was normal. In the median line of the body the *anæsthetic* was separated from the sound half by an intermediate zone about three-fourths inch wide, over which sensation was impaired only.

Paresis. The strength of both arm and leg (left) is described as "weak" at both examinations, but not so much so but that considerable use of these limbs was retained. There was no paralysis of the face or tongue, nor was there any *rigidity* or *atrophy* of muscles.

¹ Boston Medical and Surgical Journal, January 7, 1892.

Reflexes. At the first examination the right knee-jerk was feeble; the left was normal ("not exaggerated"). At the second, the reverse obtained—*i. e.*, the left was slightly diminished compared with right; both were within normal limits. The *cremasteric* was present on both sides (1891), the plantar absent on both, and neither foot was ticklish (1891). (This was ascribed to his having had both his feet frozen during the war, since which accident the soles of each had felt numb.)

Vision and hearing. He was slightly deaf, and vision was impaired on both occasions. The defect of sight was accounted for by the presence of cataract in both eyes.

The following was noted at the second examination, which was the more thorough of the two: Field of vision, *tested by the finger*, not noticeably limited. Hearing, tested by watch, showed R. c/18, L. o/18; by voice, nearly absolute deafness in left, decided deafness in right. Right drum moderately retracted; left drum was seen to be decidedly opaque and retracted. *Taste and smell* were diminished or abolished on left side.

The patient stated in most positive terms that his sight, sensation, and strength (left side) varied from day to day. Some days he had fair use of the arm; on others, he could "not raise the left arm at all."

The origin of his disability dated from 1862, when in battle he was struck on the left side by a piece of shell, or some large missile. The force of the blow was broken by his blanket—rolled up and slung around him, and the skin was not injured beyond a black-and-blue spot, which the nurse told him could be seen below the left shoulder-blade. He was knocked unconscious, and sent to the hospital. His left side was "paralyzed immediately after the accident, and has remained so ever since," though it is better now (1886) than it was.

CASE II. *Functional paralysis of the left arm, following gunshot injury; duration, twenty-eight years; death from cancer.*—The examination, of which the following are the notes, was made December 1, 1886: "There is complete *paralysis* of all the muscles of the arm and hand from the shoulder down, including the deltoid. There is slight *loss of sensation* over the whole arm. There is *no atrophy* (degeneration), although the muscles are softer to the touch than those of the right arm." There was *no rigidity* or contracture of the muscles. My notes do not mention the condition of the reflexes, although I am certain they were carefully examined, and not found to be increased. The case was a typical one of *flaccid paralysis*. Although the arm was possibly smaller than the right, as would naturally result from disuse, it did not present that atrophic appearance so characteristic of paralysis from injury of the peripheral nerves, and which is so easily recognized.

The condition of the arm followed immediately upon a gunshot wound inflicted at the battle of Gettysburg, July, 1863. The ball entered the left arm between the upper end of the belly of the biceps and the tendon of the deltoid, and passed through the bone upward and backward. From this it will be seen that the wound was not so situated as to account for the paralysis and loss of sensation. Aside from the paralysis of the muscles below the wound, it could not possibly account for the paralysis of the deltoid.

It should be said that the condition of the face and legs was normal.

A functional paralysis would seem to be the only rational explanation of the case. The subject suffered from time to time from fainting or dizzy spells. On two occasions he was found lying on the ground uncon-

scious. The unconsciousness lasted about two hours. No one seems to have ever observed anything of the nature of convulsions at these times, and the attacks are said to have puzzled his physicians. The paralytic condition of the arm persisted up to the time of his death (September, 1891), which took place from "cancer in the side." There was a tendency to improvement, as the arm was rather better during the last years of his life. He had regained a certain amount of use of it, but I am unable to say exactly how much.

CASE III. *Functional paralysis of the arm, following injury to the side.*—This case was first seen by me December 1, 1886. At that time there existed decided but not absolute paralysis of all muscles of the hand and arm, including the deltoid. There was also profound but not absolute anæsthesia over the same arm, extending above to a point half-way between the shoulder and the root of the neck, and behind over the scapular region. The anæsthetic area was separated from the normal skin by an intermediate zone about two inches in width, where the anæsthesia existed in a less degree. There was no degenerative atrophy of the muscles nor contractures or rigidity; the deep reflexes were not exaggerated. The *monoplegia* in this case dates from the battle of Newberne, March 14, 1862, when he was injured in the following way. I give the account in the patient's own words:

"In the course of the fight one of my men was wounded; being near him, I was about to give him a drink of water, and held out with my left hand a tin dipper, when a round shot struck the dipper, knocked it from my hand, passing up the length of my forearm, and, fortunately for me, had just room enough to pass between my elbow and side. The wind of the shot turned me half-way round, and threw me with great force to the ground. I was unconscious for twenty-four hours, and very much confused for a week after." On recovering consciousness the "numbness and loss of feeling in the arm were the same as at present." The arm and side were bruised, but nothing more. He thinks that when he fell, he struck on "the back of his head" and "middle of the back, either dislocating or otherwise injuring three ribs." Under date of December 2, 1891, he writes: "The spot on the back of the head is as tender and sore to touch to-day as ever;" and he still complains of great "pain and soreness directly through the ribs just below the breast-bone. If he makes a misstep, or coughs, or tries to lift anything, it gives him severe pain and remains the same as ever."

At an examination in 1886 no signs of any injury to the side or head was found; no cicatrices of wounds or anything that would account for the pain complained of. No note of the special senses was made at that time; but December 1, 1890, he writes: "My left eye-sight is as if I were in a fog; the left ear almost totally deaf." December 1, 1891, his disability still persisted unchanged. The *monoplegia* has therefore existed nearly thirty years.

That the picture presented by these cases resembles that of functional disease there can be no doubt; nor can it be doubted that this diagnosis would be made in cases presenting similar symptoms immediately after an injury. I do not see any reason to question the diagnosis because of the long persistency of the symptoms, and to assume that for this reason there must be an organic lesion present.

REVIEWS.

A SYSTEM OF PRACTICAL THERAPEUTICS. Edited by HOBART AMORY HARE, M.D., Professor of Therapeutics and Materia Medica in the Jefferson Medical College of Philadelphia; assisted by WALTER CHRYSTIE, M.D., late Physician to St. Clement's Hospital, and Instructor in Physical Diagnosis in the University of Pennsylvania. Vol. II. Pp. 1124. Philadelphia: Lea Brothers & Co., 1892.

THE second volume begins with a paper by Dr. Robert W. Taylor on "The Treatment of Syphilis," thus bringing to a close the subject of Diathetic Diseases and Diseases of Nutrition. The author is not a believer in the possibility of aborting syphilis by excision of the primary lesion, nor indeed in the early treatment by mercurials to avoid secondary infection. But when the diagnosis is absolute, he uses the approved remedies with vigor and intelligence. He discusses in full the expectant, tonic, and interrupted methods, and finally presents in a manner that shows upon every page the hand of the master the general methodical treatment, relying almost entirely upon mercurials and iodides. He frequently gives valuable formulæ for administration of mercury by the way of the mouth and stomach, inunction, fumigation, and hypodermatic injection, while his remarks upon thermal baths are judicious. The local treatment is carefully elaborated, while that of hereditary syphilis is fully explained. The paper is complete and modern, showing an extensive acquaintance with the literature, and, indeed, is in itself a monograph. Relying upon a small number of remedies, no one, after a careful study of this paper, could fail to use them to better advantage.

The treatment of Fevers occupies two hundred and thirty pages. Dr. J. Lewis Smith gives a fair statement of the resources at our command in "Scarlet Fever, Measles, Rötheln, and Varicella." "Smallpox" is the subject of a paper which is complete in the discussion of prophylaxis and treatment, dividing the course of the disease into stages, in which one finds recorded the large experience of the author, Dr. William M. Welch. A notable article, and one that should be read by every faithful practitioner, is the work of Dr. Frederick P. Henry on "Typhoid Fever." His prophylaxis is complete, his treatment excellent, exhaustive, careful, and one that will commend itself to all, save to those who appreciate but one symptom of this variable disease. He appends a good bibliography. Dr. Manuel Dominguez writes briefly upon "Typhus Fever," giving considerable attention to symptoms and devoting but a brief space to treatment. "Malarial Diseases and Dengue," by Dr. George Dock, naturally includes a consideration of the use of quinine. The paper is moderate in tone and satisfactory. In presenting the subject of "Yellow Fever," Dr. Jerome Cochran has collected the opinions of several physicians of Havana, which differ somewhat in detail of

treatment, depending upon their variations of theory. His own contribution is a very complete and intelligent statement of what we may hope to accomplish in this disease. Dr. J. C. Wilson has a much too brief space allotted to him in which to write of the "Therapeutics of Cerebro-spinal Fever," yet he has given us a good contribution.

The Diseases of the Respiratory System occupy two hundred and eighty pages. Dr. Ralph W. Seiss writes of "The Treatment of Diseases of the Nasal Chambers," in short chapters, but containing many practical suggestions. The "Diseases of the Pharynx and Larynx" were intrusted to Dr. Charles Sajous; the subject is presented in a very complete and thorough manner. Dr. J. Chalmers Cameron writes fully of "Diphtheria and True Croup," giving a valuable and resourceful paper, and, indeed, with a full appreciation of the merits of intubation as compared with tracheotomy. "Asthma, Acute and Chronic Bronchitis, and Whooping-cough," is the title of the paper of Dr. James T. Whittaker. We would object strongly to any attempt to construct a system of therapeutics for asthma, had not our author very wisely recognized that a classification was necessary. The subject of the treatment of bronchitis is not entirely satisfactory, in that there has been much work done in recent years which should have a place in this work. In whooping-cough we have a multitude of remedies mentioned, although but little that can aid us in selection. "The Therapeutics of Pulmonary Emphysema, Atelectasis, Abscess, and Gangrene," is well portrayed by Dr. M. Howard Fussell. The paper is eminently satisfactory and helpful. Dr. Edwin E. Graham goes over the subject of "Croupous and Catarrhal Pneumonia," and gives a complete and fair account of modern methods. "The Treatment of Diseases of the Pleura," by Dr. Rudolph Matas, is encyclopædic and thorough, particularly rich in therapeutic hints.

One hundred and sixty pages are devoted to a consideration of the treatment of Diseases of the Circulatory and Hæmatopoietic Systems. The first paper—on "Acute and Chronic Diseases of the Heart," by the veteran, Dr. W. H. Thomson—shows his care in observation and wealth of experience; a careful study of a few remedies, and these used to good results, although the tendency is toward combination, yet he clearly sees in each remedy its own sphere of action. Dr. T. Lauder Brunton has given a clear, readable, and very philosophical article on the "Nervous Diseases of the Heart, including Angina Pectoris." Two papers by Dr. Frederick C. Shattuck—one on "Diseases of the Bloodvessels," the other on those of the "Blood"—claim attention for the care shown in their preparation, the completeness of the treatment, and the judicial fairness in the discussion. "The Treatment of Diseases of the Liver, Gall-bladder, Hepatic Ducts, and Spleen," fully given by Dr. J. H. Musser, is eminently satisfactory, the therapeutics of the liver being particularly to be commended for the painstaking research shown in the writing. Dr. Richard C. Norris has neglected nothing in his article upon the "Diseases of the Thymus and Thyroid Glands, and Exophthalmic Goitre." It is clear, up to date, and, indeed, concise.

The final section—two hundred and seventy pages—treats of Diseases of the Digestive System, and here we find great satisfaction. Dr. A. D. Blackader, on the "Diseases of the Mouth and Salivary Glands, including Mumps," has given us a valuable paper, omitting nothing of importance. The various forms of glossitis, generally discussed in textbooks in a perfunctory manner, here receive due attention. A paper

that calls for very earnest study—because one finds here a most complete, recent, and praiseworthy compilation of the methods in vogue in our best clinics for the treatment of “Acute and Chronic Gastric Catarrh, Gastric Atrophy, Gastric Ulcer, Gastric Cancer, and Gastric Dilatation”—is by Dr. D. D. Stewart. He has supplied a long-felt want in presenting this paper, which embodies the work of the best French, German, and American clinicians. His numerous foot-notes, in many cases containing information well worthy of a place in the text, will amply repay study. This subject is exhaustively treated, condensed so far as is possible without sacrificing clearness, and represents the present knowledge of the representative practitioner. Dr. Frederick A. Packard goes over “The Treatment of Cholera Morbus, Cholera, Cholera Infantum, and Dysentery.” The treatment is in the main judicious, yet it seems that we might justly expect to find intestinal antiseptics fully discussed. “Obstruction of the Intestines,” by Dr. Edward Martin, is a fair paper upon a subject somewhat difficult to write about dogmatically, since each individual case demands especial study. “Peritonitis, Appendicitis, and Perityphilitic Abscess,” by Dr. Roswell Park, although intrusted to a professed surgeon, has not been found wanting in medical therapeutics. He has presented the recent and fair views on this subject, and this paper will command attention. The last article—by Dr. Charles B. Kelsey, on “The Treatment of the Diseases of the Rectum and Anus”—is a clearly written and practical contribution based upon a large personal experience. The mystery of this region, which to some practitioners appears to be great, will surely be lessened after a careful reading of this work.

A good index, which this volume contains, will lighten the labors of those who make this volume what it deserves to be—a companion of their daily work.

Taken as a whole, this volume is more valuable than its predecessor, in that there is not such a marked difference in the value of the articles. Yet there are many pages devoted to symptomatology and theoretical discussions which do not seem to be necessary for a clear exposition of the indications for treatment. It will take its place with the other Systems that have been published, and it will not suffer from the comparison. It fairly represents the present status of therapeutics, and shows the intense practicality and thorough good sense of the American physician.

R. W. W.

THE PRACTITIONER'S HANDBOOK OF DISEASES OF THE EAR AND AFFECTIONS OF THE NOSE AND NASO-PHARYNX RELATING TO AURAL THERAPEUTICS. By H. MACNAUGHTON JONES, M.D., M.Ch., M.A., and W. R. H. STEWART, F.R.C.S. Ed., etc. Fourth edition. 12mo. Pp. 392. With 152 illustrations and two lithographic plates. London: Baillière, Tindall & Cox, 1892.

In the fourteen years that have elapsed since the appearance of the first edition of this work, much has appeared in otological literature to claim notice or attention in a text-book, and this excellent manual of Jones and Stewart has grown threefold and taken cognizance of all the

more important matters. Designed to be eminently practical, little space is given to anatomy and physiology, and these and other topics are dealt with so curtly as sometimes to demand outside study to render fully comprehensible what is given. The etiological views seem based largely upon some 4000 cases of the authors, with little reference to the wide statistical studies of Buerkner and others; but the review of the various forms and causes of ear disease is careful and good, according well with the best authorities. The lines laid down for the study and record of cases, the history-taking, the testing of hearing, the investigation of the naso-pharynx and of the ears themselves, are concise, practical, and generally unexceptionable. Ogston's observations and diagrams as to the limits of the fields of hearing are given at some length, without criticism; although it is elsewhere noted that the watch can be heard by the ear which is turned away from it. As with many textbooks, "introducing a speculum" is used too often as equivalent to making an ocular examination of the auditory canal and drum membrane—a procedure in which the speculum is often unnecessary and at times undesirable. In investigations of the hearing by the tuning-fork, Rinne's test might be better described (especially in Roosa's simplified form, "is it louder back or in front of the ear"); and Gellé's test deserves fuller notice as a means of deciding whether the stapes is ankylosed or not.

Two chapters are devoted to nasal matters in their relation to aural affections, and include the excellent rules: "But in operative procedures, we submit, we are bound to go cautiously. In those aural cases which come under our observation that demand operative interference in the naso-pharynx, we are influenced by (1) the presence of hypertrophied tonsils—all such, we believe, should be reduced or removed in cases of tinnitus and deafness; (2) the presence of adenoid growths—these should be removed; (3) hypertrophied portions of turbinated bones and morbid growths, polypi—these should be excised or reduced; (4) displacements and ecchondromatous enlargements, with consequent deviation of the septum—require interference to free the obstructed nasal passage."

Good directions are given as to the employment of the Eustachian catheter and the various uses of the syringe are well described, except that sight is not constantly employed as a guide. Syringing per catheter is rather a favorite measure, and Hinton's views as to mucus in the tympanum are accepted to the utmost limit of the authors' only partially confirmatory experience. The surgeon is held to be the proper person to do almost every part of the treatment, leaving little to the patient or friends: "Of late years the conviction has grown on us that the fewer the washes we use in aural practice the better." Less commendable are the views as to poulticing and warm fomentations in furuncle of the meatus, and the employment of insoluble powders, iodoform by preference, in suppuration of the tympanum.

The importance of mastoid suppuration is well dealt with, and early incision and bold but careful opening of the bone are advised in its treatment, drainage being the object of the operative intervention rather than the eradication of all morbid tissues. The drill or one-quarter-inch trephine is preferred, therefore, and the perforation made close behind the meatus and parallel with it, in accord with the study of Birmingham, quoted at some length. Other operative measures such

as tenotomy, excision or mobilization of ossicles receive short and cautious notice.

"Perchance as a personal sufferer in the past from two distinct forms of tinnitus" is the explanation Jones gives for his "abbreviated" account of tinnitus, which occupies six of the twenty-four chapters of the work. The study is very complete and as satisfactory in its teachings of the causes and treatment of this most troublesome symptom as the difficulties of the subject permit. Electricity is warmly commended on the ground of actual success achieved, and some who have been discouraged by the non-success of themselves and others may find here reason for further trial.

The final chapter is given to a *résumé* of formulæ and other therapeutic suggestions, which is good, though rather vaguely comprehensive. We miss any reference to the valuable cleansing properties of hydrogen dioxide, would advise extreme caution in the use of cocaine (4-10 per cent.) as a nasal spray, or the mopping with 20 per cent. solution elsewhere mentioned, and would note that it is much more convenient to fuse chromic acid or silver nitrate by dipping the hot probe into the crystals and then holding again near the heat. Swabbing with saturated chromic acid solution, as mentioned on page 187, seems dangerous even in skilled hands, and not to be recommended in a text-book.

There are some verbal errors, such as "mucous lining of the meatus," "trocular herophyte," and some ungraceful or obscure sentences; but the language is often terse and excellent, as in the statement: "Quietness and firmness with friends, patience in using the syringe, extreme caution with all forms of mechanical helps, are the essentials for successfully dealing with foreign bodies in the ear." The illustrations are numerous and excellent, and the book, as a whole, a very good realization of the effort of its authors to furnish a practical manual of treatment.

B. A. R.

LEÇONS CLINIQUES SUR LES MALADIES MENTALES. LE DÉLIRE CHRONIQUE À ÉVOLUTION SYSTEMATIQUE. Par V. MAGNAN. Recueillies par MM. LES DRS. JOURNIAC et SÉRIEUX. Paris, 1891.

CLINICAL LECTURES ON MENTAL DISEASES. CHRONIC INSANITY OF SYSTEMATIC DEVELOPMENT.

It has long been evident that any attempt to classify the insanities is premature; that all existing systems of classification are but tentative; and that the reason for this is that the anatomical and even the clinical knowledge of insanity is yet far from accurate and profound. If we turn to the text-books that contain the most ambitious and dogmatic systems, such especially as have been inspired by the German school, we are impressed with their inconsistencies and their failure to group and harmonize the increasing number of accurate pathological findings. The author of the most original modern work on insanity, Bevan Lewis, has contended himself apparently with no classification whatever, but has demonstrated a wealth of brain-pathology quite unheard

of in the older text-books, which will perplex the systematists for many a day to conform to it their schemes of classification.

M. Magnan's book introduces us to a subject than which none has been more prolific of endless debate about its place in nosology—the systematized delusion. It is pleasant, however, to find but little of this debate in M. Magnan's book. It is one of its special merits that it is not controversial, but strictly scientific in spirit and matter, and that it presents an array of carefully observed facts, which go far to establish the disease of which it treats as a distinct entity. The author gives a short *résumé* of the recent famous discussion before the Medico-psychological Society of Paris, in which the "délire chronique" withstood the desperate assaults of the partisans of monomania, and passes on to a brief historical sketch of the opinions of Lasègue, Morel, and Foville, who, after Esquirol, have moulded professional opinion in France and elsewhere on monomania. He then devotes his book to a careful clinical description, based upon many cases, of the "délire chronique à évolution systématique," or, as we may translate it, "chronic systematized insanity," a form of insanity by no means new, but which many will recognize, perhaps for the first time, when freed now by Magnan from its forced and unnatural association with monomania, paranoia, or the hereditary degenerated groups.

M. Magnan's position is briefly this: There exists a psychosis which has four successive periods. 1. Incubation. 2. Period of delusions of persecution with hallucinations of sight, hearing, etc. 3. Period of delusions of grandeur. 4. Dementia. This psychosis ought to be clearly separated from the systematized insanity of the hereditary and degenerated class. It has a physiognomy so personal, a march so regular, a prognostic so constant, that it ought not to be confounded with all the insane who merely have persecutory delusions. For Magnan this is a species clearly defined, and distinguished from all other forms of insanity as well by its beginning as by its regular course. Because of its regular progress it has been called by Garnier "progressive systematized insanity." Finally, it is observed only in subjects who are *not* hereditarily insane, and whose minds are normal up to the beginning of the disease.

The author insists constantly upon this regular progressive character of the disease, and upon its occurrence in persons entirely free from the stigmata and physical deformities of the hereditary insane. The disease makes its debut with a more or less prolonged prodromal period. This is characterized by illusions, false interpretations, and inquietude. In the second period, the chief symptoms are hallucinations, especially auditory, affections of general sensibility, and delusions of persecution. The third period presents one of the most characteristic features of the disease, the transformation of the persecutory into the ambitious delusion. The fourth, and last, period is marked by the decay of the mind, permanent dementia. These periods succeed each other invariably in the same order. The modes of reaction of the patient to his delusion in the second period also follow, according to Magnan, a set rule. First, he flees, and avoids the imaginary dangers. Second, he defends himself. Third, he assaults his enemies and persecutors. He thus becomes the frequent object of medico-legal inquiries. The transformation of the delusion of persecution into the delusion of grandeur is one of the most interesting phenomena in mental pathology. It is

sufficient to say that the delusion of grandeur is a symptom of evil augury, and is too apt to show itself just when the mental organism begins to disintegrate, as in this disease and in general paresis. Dementia always closes the scene. The prognosis of chronic systematized insanity is hopeless, but it does not impose the brand of a necessary mental taint upon kindred and posterity.

In conclusion, we are impressed with the truthfulness of Magnan's clinical picture, for it corresponds with much that we have seen. It presents not so much a new type for classification, as a living disease, seen-through all the confusion of theory and controversy, and properly described.

J. H. L.

THE PRINCIPLES OF BACTERIOLOGY: A MANUAL FOR STUDENTS AND PHYSICIANS. By A. C. ABBOTT, M.D., First Assistant, Laboratory of Hygiene, University of Pennsylvania, Philadelphia. With Illustrations. 8vo., pp. viii, 263. Philadelphia: Lea Brothers & Co., 1892.

THE increasing importance of a knowledge of the rudiments of bacteriology to every medical student of the day has created a demand for a text-book that would embody the results of the latest investigations, and that would furnish a summary of the best methods of technique in present use. Various small volumes designed to fill such a want have made their appearance during the past year, but no very satisfactory one in English until the publication of the one under consideration. As stated in the preface, the author has kept in mind the needs of the student and practitioner of medicine, and has endeavored to satisfy these needs by as direct a statement of the principles of the work as might be. In this effort he has attained a great degree of success, and the book will serve as an exceedingly valuable assistant upon the laboratory table for anyone engaged in this sort of work.

Ideas of technique are here presented in a concise form for the first time in English that are of great value, and that have heretofore been inaccessible to the majority of beginners; for this reason alone the book is one that can hardly be spared. It furnishes the most satisfactory manual upon the subject of which it treats yet published in English.

[NOTE.—An apology is due the author for the delay in the preparation of this notice—but it has been caused by the illness of the reviewer.]

H. C. E.

HANDBOOK OF DISEASES OF THE EYE AND THEIR TREATMENT. By HENRY R. SWANZY, M.B., F.R.C.S.I., Surgeon to the National Eye and Ear Infirmary; Ophthalmic Surgeon to the Adelaide Hospital, Dublin; Examiner in Ophthalmic Surgery in the Royal University of Ireland. Third edition. London: H. K. Lewis, 1890.

THIS handbook in its slightly enlarged third edition preserves the valuable features of former editions, and presents several changes that add materially to the interest and value of the work. One of these changes

is the introduction of a number of additional original illustrations, another is the recasting of the portion treating of the diseases of the uveal tract and including them with sympathetic inflammation in a single chapter.

But probably the most valuable additions are to be found in the chapter on "Amblyopia and Amaurosis due to Central and other Causes," where we find the practical essence of the author's monograph on the *Value of Eye Symptoms in the Localization of Cerebral Disease*. It is very pleasant to find the most recent results of investigation in this field, of great present scientific activity, so well presented, without giving up space to unnecessary detail and matters of only temporary interest.

In regard to matters still *sub judice* with ophthalmic surgeons we note that Swanzy continues to favor iridectomy in cataract extraction; and is evidently skeptical as to the causation of nervous disease by "insufficiencies" of the ocular muscles.

E. J.

THE POCKET PHARMACY, WITH THERAPEUTIC INDEX. By JOHN AULDE, M.D. Pp. vi., 185. New York: D. Appleton & Co., 1892.

A GUIDE TO THERAPEUTICS. By ROBERT FARQUHARSON, M.P., M.D. EDIN., F.R.C.P. LOND., LL.D. ABER. Pp. xii., 406. Fifth edition. London: Smith, Elder & Co., 1891.

COCA AND COCAINE. By WILLIAM MARTINDALE, F.C.S. Pp. viii., 76. Second edition. London: H. K. Lewis, 1892.

THE title of Dr. Aulde's book is misleading, in that we might expect to find a small work treating of the science of drugs and the art of selecting, preparing, and combining them. It is only in the sub-title, "a *résumé* of the clinical applications of remedies adapted to the pocket-case, for the treatment of emergencies and acute diseases," that we find declared the true scope of his work. It is, in fact, a therapeutic index to the use of acetanilide, aconite, atropine, bryonia, camphor, cannabis, gelsemium, ipecac, morphine, quinine, rhus, strophanthus, strychnine, trinitrin, and certain salts of arsenic, calcium, copper, iron, mercury, and zinc, and when used in form of pill, tablet, or granule. It omits certain remedies, which might properly be included, useful for emergencies, for example, apomorphia, while in recommending scientific medication such combinations as the acetanilide, alterative, calcium sulphide, copper arseniate, morphine hydrochlorate compounds are inadvisable in a pocket-case when extemporaneous combinations could better be made. Again, there is lack of uniformity of dosage, calcium sulphide being given in one-tenth of a grain and strophanthus (tincture) in two-minim doses, the latter being evidently too large for as frequent repetitions. The book, although a very useful one, yet must be used by one with considerable experience, because of necessity the generalizations are brief. One should not practice by it for a special disease but after a thorough study of its contents. It is readable, well brought down to the present times, and, taken as a whole, optimistic.

Dr. Farquharson has done more than written a guide, as he modestly terms it; he has given to the profession a treatise on the subject, and so.

well has he done his work that it is now in the fifth edition. The section devoted to diet is judicious, while a brief report on the uses of the mineral waters is good. He has remodelled the portion treating of narcotics and purgatives, and the subject of antiseptics, so far as it applies to surgery, is excellent. He has classified the remedies so that the subjects are easily studied. Each drug is discussed from the standpoint of its physiological and its therapeutical action in parallel columns, and this is done concisely and clearly. The therapeutic column is full of practical points, and the addition of frequent formulæ is an excellent feature. Taken as a whole it is interesting to read and withal a safe text-book.

Mr. Martindale has rendered a good service to the profession in collating the literature of coca and its alkaloid—cocaine. In thirteen chapters he gives the early history of the drug, the superstitions, its literature, not omitting, even, an extract from the poetry of Abraham Cowley, the account of modern travellers, its cultivation (observations by Dr. Rusby), Dr. Mantegazza's experiments, the botanical description, the report of U. S. Minister Gibbs, its use as a restorative, the pharmaceutical preparations, and its medical uses. In two chapters cocaine and its salts, with a list of the conditions in which they may be employed, receive due attention, and this very complete little book ends with an excellent list of references to current medical literature. R. W. W.

THE ETIOLOGY, PATHOLOGY, AND TREATMENT OF DISEASES OF THE HIP-JOINT. Fiske Prize Fund Dissertation No. 42. By ROBERT W. LOVETT, M.D., Out-Patient Surgeon to the Boston City Hospital; Assistant Surgeon to Out-Patients at the Children's Hospital, Boston; Member of the American Orthopedic Association. 8vo., pp. 220, with 56 Illustrations. Boston: George H. Ellis, 1891.

THE author of the monograph in hand has seen fit to confine himself to the exact minimum requirements of the subject set by the Trustees of the Fiske Prize Fund for the prize of 1891. By so doing, or perhaps being compelled to do, he has given to the work its only serious defect, namely, incompleteness; for it must be admitted that a book intended for general reference and study is unfortunately deficient when deprived of any reference to symptomatology and diagnosis. However, it is a pleasure to turn our attention from what the book does *not* contain to that which it does furnish when the matter is so excellent as is here presented, for therein are compiled, epitomized, and arranged in a pleasing, scholarly manner, by the hand of an erudite specialist, all important facts and theories relating to the etiology, pathology, and treatment of diseases of the hip-joint, leavened throughout by the author's own wide clinical experience and experimental deductions.

In Chapter I. a tentative working classification of the diseases of the hip is given with the reservation that "in the present state of pathology it is impossible to present any classification of diseases of the hip-joint which shall be sanctioned by authority weighty enough to give it pre-

eminence," for "it is essentially a time of transition in the history of the pathology of bone and joint disease."

The second chapter is devoted to the acute arthritis of the hip in infants, which "is to be considered as an acute joint destruction, in most cases pyæmic, but also to be attributed to other causes," originating usually as an acute infectious osteomyelitis of the upper epiphysis of the femur. Then follow two chapters upon acute and chronic synovitis, in which the writer sufficiently emphasizes the dangers involved in giving a diagnosis of simple synovitis, rather than in every case presuming the presence of and treating for tuberculosis, until, by its course, the case is proved to be one of the simpler inflammation.

Chapters V. and VI. are devoted to "Tuberculous Ostitis of the Hip," in which ordinary "hip disease" is described, and its specific origin enunciated. Here is centered the chief portion and interest of the work; the discussion of pathology and treatment is judicious, properly conservative, and practical, while the text is illuminated and ornamented by a splendid series of photo-engravings which admirably convey the writer's meaning as well as clinical pictures of the various forms and features of the malady. Regarding the etiology of hip disease the author advocates the opinion that "it occurs, as a rule, only in those who have an hereditary or acquired tendency to tuberculosis, and that in a large porportion of these cases an accident is the exciting cause. He inclines to the belief that in the treatment of tuberculosis here situated, "traction produces very decided modification of intra-articular pressure, and in some instances undoubtedly results in distraction of the joint surfaces." Hence treatment for very prolonged periods by appliances which produce traction as well as fixation is strongly advised. We note with pleasure the simplicity, practicability, and limited varieties of apparatus commended and pictured in these chapters—a very unusual, but none the less acceptable, departure in orthopedic literature.

In the section devoted to operative treatment all the various theories and methods are balanced and a sound choice invariably made; but the actual descriptions of some of these procedures—notably, excision of the hip-joint—are too brief and incomplete for the average reader. Early free incision, scraping and irrigation of the sac, and immediate suture without drainage are urged in the treatment of hip abscesses, and supported by successful clinical experience, but where there is "much inflammatory exudation into the tissues, in cases which are particularly acute, and in very extensive abscess cavities," open incision and packing are advised as preferable. Aspiration is condemned, and iodoform injections are ignored. We regret to find flaxseed poultices recommended as applications to fresh incisions into suppurating tissues.

"Gummatous Arthritis," "Arthritis Deformans," "Charcot's Disease," "Tumors," Loose Bodies," and "Hysterical Affections," are each accorded chapters, but require no special comment.

Finally, "Congenital Dislocation of the Hip" receives notice in one of the best *résumés* of this subject that has yet appeared. Mechanical measures of relief are most favored, and all operations are declared probably useless save that of Hoffa alone, which is yet on trial, but gives much promise.

A feature of this monograph is the almost encyclopædic lists of references which close each chapter, and attest the diligence of the research

which has preceded its writing: these alone will make the book invaluable for reference.

The typographical and artistic features of the work leave nothing to be desired, but the absence of an index is a very aggravating omission in this otherwise excellently made up volume. T. S. K. M.

A DICTIONARY OF TREATMENT, OR THERAPEUTIC INDEX, INCLUDING MEDICAL AND SURGICAL THERAPEUTICS. BY WILLIAM WHITLA, M.D. Revised and Adapted to the Pharmacopœia of the United States. Philadelphia: Lea Brothers & Co., 1892.

THIS is an octavo volume of nearly 1000 pages, intended for a ready reference book, and as such will be found useful. The maladies are alphabetically arranged; under each head the author states as briefly as possible the indications to be met, and the best means of meeting them. In diseases when special difficulties or dangers may be confronted he gives a concise statement of the pathological conditions, and the way each should be treated, often adding valuable notes in pharmacology. In some instances his directions for management are quite minute. For example, in the nine pages devoted to constipation the conditions on which this physiological vice depend, and its various forms and degrees, are set forth in a few words, together with the manner of combating each most successfully.

The management of heart affections occupies twenty pages, and includes, besides a brief mention of the recognized reliable methods of correcting this disturbance, a short and practical discussion of the conditions in various stages of organic diseases and their effects, giving the reasons for cure in diet, exercise, and the selection of medicines.

Under hydrophobia and tuberculosis especial attention is given to the recent much discussed therapeutic methods. The rules laid down by Pasteur for the treatment of the former are given in detail, besides other methods that have seemed to be of value.

As to the latter the author shares the regret of the civilized world that tuberculin has not proved to be what was at first expected, but referring to the recent contributions upon the subject he shows that a better understanding of its nature is being arrived at.

In the twenty-four pages given to pulmonary phthisis the very many methods of management are either fully described or briefly mentioned, and their usefulness commented upon. Climatic treatment is viewed solely from a European standpoint, and the advantageous localities of the Eastern hemisphere are given. The rules governing the selection of a climate for each class of cases are, however, universally applicable.

Very little is said in the work concerning the treatment of that very large and rather indefinite class of troubles arising from intestinal indigestion and from inadequate performance of the hepatic functions. These, for the most part minor maladies, cause much distress, and often tax the resources and ingenuity of the practitioner.

There are many points in the book that would seem to bear some revision; but it is, nevertheless, the most complete and satisfactory small work of its kind published.

F. S. J.

STRICTURE OF THE RECTUM: A STUDY OF ONE HUNDRED AND THIRTY-EIGHT CASES. By CHARLES B. KELSEY, M.D., Professor of Diseases of the Rectum at the New York Post-Graduate School and Hospital; late Professor of Rectal Surgery at the University of Vermont, etc. 8vo., pp. 48, with 12 illustrations. Second edition, enlarged. 1892.

THE second edition of this valuable monograph appears greatly enriched by the addition of descriptions and comments of all the recent additions to major rectal surgery; otherwise the changes are but those incident to the greater experience and riper judgment of one of the foremost workers in this special field.

The writer's cases of stricture of the rectum—tabulated to the end of 1891—now number 138, and certainly afford ample material upon which to base authoritative conclusions, but, as the work is already familiar as a whole to the profession, we will but notice a few of these conclusions relating to operative procedures.

For dilatation the soft rubber bougie is commended, of which a size should be employed "which will pass through the stricture without force, and which may be left in place for several hours without causing uneasiness," and by which absorption, not stretching, of the pathological product is desired.

Linear proctotomy is not highly favored except in unusual cases, as dilatation has to be maintained subsequently whether the incision is employed or not. But if incision is determined upon it should invariably be carried down to and through the sphincters to provide for drainage; otherwise these become "the most dangerous incisions in the surgery of the rectum," because of the risks incurred from hemorrhage and sepsis.

It is stated that cauterization and electrolysis can accomplish nothing that cannot better be done by linear proctotomy; that in malignant diseases these procedures are contra-indicated; and further, that "electrolysis reduced to fact means, in the treatment of stricture of the rectum, either simple dilatation or the application of the cautery."

Regarding excision of the rectum the opinion is advanced that the disease should not be thus dealt with "unless there is reasonable certainty that it can all be removed, and that the lymphatics have not to any extent become involved"—colotomy is strongly urged as the alternative. Kraske's operation and its modifications are clearly described and commended, but the author, in his 138 cases has found none in which it appeared applicable, owing to the extent of disease.

It is urged that colotomy be performed at a much earlier stage than has been the rule heretofore, and the iliac, inguinal, or abdominal—whichever term may be preferred—in preference to the old lumbar method, is given unrivalled precedence in the writer's estimation. "It is not a dangerous operation when done under anything like favorable circumstances," and, "as to the benefits arising from the operation, too much can scarcely be said." His own objections to colotomy were formerly deeply rooted, but, in common with most modern surgeons, they have been entirely removed.

An interesting tabular record of the 138 cases upon which the brochure is based concludes the work.

T. S. K. M.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D.,

PROFESSOR OF CLINICAL MEDICINE IN THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND
HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THIOPHEN.

An unsigned paper in the *Revue de Thérapeutique Générale et Thermale*, 1892, No. 5, p. 70, gives an excellent *résumé* of this subject. Thiophen is a hydrocarbon of the aromatic series, a colorless, limpid oil, of faint odor, and miscible with water in all proportions, having as its symbol C_4H_4S . Spiegler has used the thiosulphate of soda ($C_4H_3SNaSO_3$) and the iodide of thiophen ($C_4H_2I_2S$). The soda salt is a white powder, precipitated in the form of scales, contains 33 per cent. of sulphur, of a disagreeable odor which is usually not marked when in a 5 or 10 per cent. ointment. In prurigo complicated by eczema it can replace naphthol. The biniodide has been used as a substitute for iodoform. It crystallizes in beautiful plates, insoluble in water, but very soluble in ether, alcohol and chloroform. Its odor is characteristic, but not disagreeable; gauze impregnated in a proportion of 10 per cent. emits a slight odor, rather agreeable and aromatic. This salt, in the laboratory, will prevent the development of the *staphylococcus aureus*. In burns even to the third degree; so far as preventing odor and desiccation, it is superior to iodoform. Hock has used it in various conditions, phlegmon, contused wounds, lacerations, compound fractures, mastitis, onychia, and caries, with very satisfactory results. There seems to be no poisonous action; it does not give rise to eczema, it even seems to cure it, when existing. Applied as a powder it is a vigorous disinfectant, and may even give rise to a burning sensation which may persist for half an hour. It will deodorize more energetically than iodoform, but it is a less active stimulant of granulation-tissue.

SALIPYRINE.

DR. CH. ELOY gives a short review of this remedy, which was obtained by Spica, of Padua, by the mixture of 73 parts of salicylic acid with 100 parts of

antipyrine. It occurs in crystals, transparent, of sweetish taste, and decomposed by heat. Slightly soluble in cold water, it is very soluble in warm, and especially in alcohol. It possesses antipyretic and analgesic effects, and, like antipyrine, may give rise to exanthemata. In acute rheumatism it diminishes the pyrexia and pain, but is used in large doses, ninety grains or more daily, either in wafers or dissolved in glycerin or syrup of raspberry, and distilled water. After two days' treatment by large doses, a daily dosage of from fifteen to thirty grains is sufficient. In chronic articular rheumatism one commences with a daily dose of sixty grains, which is increased by fifteen grains, should the former prove insufficient. As the symptoms improve, the amount can be gradually diminished to seven grains, which must be continued for several weeks. In neuralgia and rheumatic hemicrania a daily amount of thirty grains, taken in two doses at an interval of three or four hours is beneficial; and as the pain becomes lessened, the remedy must be diminished and continued in the same manner as in the case of chronic articular rheumatism. It seems to be a very valuable remedy in rheumatism, and particularly in the very painful forms.—*Revue Générale de Chirurgie et de Thérapeutique*, 1892, No. 8, p. 123.

THE TREATMENT OF CHRONIC GASTRIC AFFECTIONS BY WASHING OUT THE STOMACH.

MR. D. HARVEY ATTFIELD classifies his cases as follows: (a) Muscular power in the stomach insufficient; (b) spasm of the pylorus; (c) abnormal dilatation of the stomach; (d) some cases of cancerous disease; (e) rare cases of sacculation; (f) obscure cases of obstinate vomiting. He summarizes his results as eminently satisfactory in that—(1) Vomiting is entirely checked; (2) the accompanying debility and nausea are avoided; (3) there is a marked decrease in pain; (4) there is an increase of appetite; (5) spontaneous action of the bowels frequently follows; (6) we can completely empty the stomach; (7) we can favor the recovery from dilatation. His cases show that there is a great therapeutic advantage by washing out the stomach with a siphon-tube.—*The Practitioner*, 1892, No. 284, p. 108.

DR. W. SOLTAU FENWICK presents the other side of the picture. Among the dangers he cites: (1) Convulsions and tetany. Probably, because in a case predisposed to convulsive seizures by the chronic absorption of certain morbid products from the dilated stomach, the irritation of a gastric tube may constitute an efficient exciting cause. (2) Syncope and sudden death. Any sudden alteration in the gastric pressure can, in certain cases, bring about a reflex condition of shock. (3) Perforation. The using of a gastric catheter for the purpose of investigating the chemical contents of the stomach in cases of acute gastric ulcer, is a useless and mischievous procedure. (4) Hemorrhage. Danger may arise from a too rapid evacuation of the contents of a dilated stomach. (5) Injury to the œsophagus or to the walls of the stomach. (6) Poisoning. From the use of antiseptics through the tube. Cases are cited illustrating each division. He concludes that the stomach is washed out for all sorts of symptoms, some of which are manifestly not to be benefited by this procedure. And in cases in which it fails to do good it is likely to be productive of harm in removing products of digestion whose manu-

facture has caused the stomach a considerable amount of labor. The indiscriminate use of this method in every case of disordered digestion will prove to be a curse rather than a benefit, and will eventually throw discredit upon the whole method of treatment.—*The Practitioner*, 1892, No. 286, p. 241.

ON THE PRESENCE OF A DIGESTIVE FERMENT IN THE ANAGALLIS ARVENSIS.

PROFESSORS G. DACCOMO and P. L. TOMMASOLI found that this plant, made into a paste, would digest raw meat within four to thirty-six hours, at a little above the temperature of the body. To isolate the ferment they comminuted the plant in double its weight of distilled water, squeezed out the residue and washed it, obtaining the active principle in an aqueous solution, which was evaporated and treated with ten volumes of absolute alcohol. This was repeated three times, until a white precipitate was obtained. This product dried at an ordinary temperature with sulphuric ether, gave a white, amorphous, friable mass, having its peculiar odor. On calcination 11.22 per cent. of ash was obtained. The powder possesses a digestive property equally with the crude plant. It does not have any action upon starch, and apparently loses, after some time, its efficacy in digesting proteids. It is hoped that, with better methods of preparation, it may be made so that it will retain its properties.—*Rassegna de Scienze Mediche*, 1892, No. 4, p. 141.

[The classical work of Wurtz on the *Carica papaya* has stimulated others to search for vegetable digestive ferments. The *Anagallis arvensis*, scarlet pimpernel, is not an unknown remedy, although this is the first time it has been supposed to have any valuable properties. Orfila found that in three drachms of the extract was contained sufficient poison to kill a dog, with marks of inflammation of the bowels. It has been used for consumption, dropsy, epilepsy, mania, and, like most other remedies, as a preventive of hydrophobia. Heintzelman obtained a volatile oil from the dried herb, four drops of which caused intense headache and nausea, lasting for twenty-four hours, with pains throughout the body. Evidently, it is by no means an innocent plant.—R. W. W.]

THE TREATMENT OF ENTERIC FEVER.

DR. M. A. BOYD has modified his views upon this subject in the way of bringing his treatment more into harmony with the results of bacteriological investigation. Looking at the disease as primarily a catarrhal inflammation of the intestines, and, secondarily, as one of septic poisoning, his treatment resolves itself into suitable diet, and antiseptics. The diet should be bland and unirritating, such as will be absorbed mainly by the stomach and duodenum, and leave little to be dealt with by the lower part of the small intestine. He does not believe that he can abort a case of typhoid when once the characteristic fever has begun, but he can prevent, in the majority of cases, the septicæmic phenomena, which we have chiefly to deal with after the second week of the fever has passed. In choosing an antiseptic it should be one exercising its effects, not in the stomach, but in the intestinal canal, and should disinfect not only the contents of the bowels, but the intestinal walls

as well. The choice was made of chlorine in an alkaline solution, which mingles best with the contents of the intestine, and, knowing well how easily the intestines absorb gases and pass them into the blood, it is hoped that this gas will thus be more efficient. In more than one-fourth of his cases, when this treatment was begun early, the febrile process came to an end about the fourteenth to the sixteenth day.—*The Practitioner*, 1892, No. 284, p. 81.

TYPHOID FEVER SUCCESSFULLY TREATED WITH FEL BOVIS.

DR. ADOLPH ZEH, after an extended use of the various antipyretics and intestinal antiseptics, reports favorably upon the use of this remedy in ten cases. He empties the alimentary canal by a sufficiently large dose of calomel, if the case is seen early; stimulates at once, preferably with whiskey; uses strychnine, caffeine, ammonia, camphor, and small doses of quinine; as a beverage, dilute nitro-muriatic acid in a large quantity of water, and fel bovis purificatum siccum in doses of two to four grains from three to six times daily in capsules. A liquid diet—milk, beef-tea, gruel, beef extracts or meat juices—is insisted upon.—*Merck's Bulletin*, 1892, No. 2, p. 83.

THE TREATMENT OF INFANTILE DIARRHŒA OF WARM COUNTRIES.

DR. F. ROUX divides the diarrhœas into four classes: 1. Simple catarrhal enteritis, frequently developed by cold, requires only rest, restricted diet, soothing applications to the abdomen, and graduated doses of paragoric. 2. Diarrhœa dependent upon digestive insufficiency, requires a small amount of magnesia in a half-glass of Vichy (St. Yorre) as a purgative, a milk diet, and soups devoid of fat. If the stools are offensive, a powder consisting of equal parts of the salicylates of bismuth and magnesia; naphthol being here contra-indicated because of the irritation which it produces. The return to the ordinary diet must be gradual, and before each meal he directs small doses of nux vomica, rhubarb, anise seed, and calumba, in a claret glass of Vichy or Vals. During the meals hydrochloric acid, and afterward pepsin, diastase, and pancreatin. He counteracts diarrhœa and vomiting by opium, the constipation by rhubarb. 3. The diarrhœa that follows dysentery calls for enemata of boric acid, nitrate of silver, or tincture of iodine, and the prescribing of a strict diet. 4. In true tropical diarrhœa the small intestine is the seat of disease, and it is necessary to insist upon intestinal antiseptics, salicylate of bismuth, sulpho-carbonated water, enemata of boric acid, or, better, of borated infusion of eucalyptus, with abdominal counter-irritation, as by tincture of iodine, or gentle frictions with flannel moistened with turpentine. The only method of satisfactory cure consists in an absolute milk diet, to which is added lime-water or Vichy salt. As soon as the stools are formed, beef-tea, peptones, slightly cooked white of egg and raw beef, eggs and milk, and, last of all, rice in milk can be tried. At all times remedies which assist digestion must be employed, while wine and every form of alcohol is absolutely prohibited. When the disease is cured, it is necessary for a long time to watch over the diet, and use remedies that build up the general condition.—*Revue Générale de Clinique et de Thérapeutique*, 1892, No. 9, p. 137.

THE PHYSIOLOGICAL ACTION OF ABDOMINAL MASSAGE.

DR. VICTOR ELTZ, having studied the contributions of Reibmayer and Nothnagel, believes that the action of massage in chronic intestinal catarrh depends upon the resorption of the infiltration of the wall of the intestine. In this view massage does not meet the indication of one symptom, but rather attacks the cause itself. The indications for the several methods for evacuation are: 1. For simple clearing of the bowels, *e. g.*, intestinal stenosis, internal purgatives. 2. For congenital hypoplasia of the muscular structures of the intestine, especially of the large intestine, irrigation. 3. In constipation, in general weakness, gymnastics, especially when lack of exercise is the cause. 4. Massage is indicated in—(a) true habitual constipation; (b) chronic intestinal catarrh (equally whether accompanied by diarrhoea or atony).—*Wiener klinische Wochenschrift*, 1892, No. 15, S. 221.

CREASOTE AND ITS ELEMENTS.

DR. E. MAIN has made a laboratory study of this remedy, which has of late attracted so much attention. He established the fact that the elements of creasote were poisonous in the following order: 1, para-cresylol (least); 2, phlorol; 3, guaiacol; 4, creasote; 5, creasol (most). Locally, creasol was the most irritant, guaiacol the least. For all these elements this laboratory work shows three important characteristics: 1, that they are feebly poisonous; 2, a tolerance can be established; 3, they are eliminated by the lungs. As remedies against tuberculosis they can be arranged in the following order: 1 and 2, phlorol and creasol; 3, para-cresylol; 4, guaiacol; 5, creasote (most powerful). It is believed that although all the elements of creasote have some value, and indeed guaiacol should be especially mentioned, yet creasote is the most active. Beechwood creasote should be preferred for its antiseptic power, for its feeble toxicity, and because of the results furnished by experimental therapeutics as well as by clinical observation.—*Bulletin Générale de Thérapeutique*, 1892, liv. 10e, p. 205.

THE TREATMENT OF PULMONARY TUBERCULOSIS BY INHALATIONS OF SULPHIDE OF CARBON WITH PHOSPHATE OF LIME.

DR. COROMILAS has treated ninety-nine patients suffering from pulmonary tuberculosis, recording fifty-eight successes, of which twelve relapsed, and seven were cured. Six patients died without having received any benefit, and five others succumbed from complications. He uses tonics and antipyretics while continuing the inhalations. His formula is: Sulphide of carbon, 15 parts; phosphate of lime, 10 parts; water, 100 parts. Every eight or ten days he adds 5 parts of the sulphide until he reaches 30 parts, which he does not exceed. The apparatus should contain only six ounces of water; in cold countries it should be covered with cotton to assist the evaporation of the carbon; the apparatus must be well shaken to mix the ingredients; three or four deep inhalations should be repeated every three or four hours, later every two or three hours; the medicament must be renewed every eight or ten days, because the carbon is exhausted; if hæmoptysis supervenes, treatment

must be suspended until its complete cessation. In conclusion, he believes that this remedy has an undeniable and powerful action against pulmonary tuberculosis.—*Journal de Médecine de Paris*, 1892, No. 16, p. 195.

THE TREATMENT OF BONE AND JOINT TUBERCULOSIS BY IODOFORM-OIL.

DR. ERNST BÖHNI uses a 5 per cent. solution of iodoform in oil of sweet almonds in preference to a solution in ether, or emulsions in olive oil or glycerin. He washes the iodoform with a solution of sublimate, and sterilizes his oil by heat, and obtains a solution that is permanent. He uses cold applications for a day after each injection, brine baths, massage, and passive motion, believing that immobilization is detrimental. He reports twenty-eight cases, of which seventeen were completely cured, and ten essentially improved. He insists upon nourishing diet, and out-door life.—*Correspondenzblatt f. Schweizer Aerzte*, 1892, No. 9, S. 271.

THE TREATMENT OF SIMPLE PLEURISY BY SALICYLIC PREPARATIONS

DR. H. KÖSTER discusses this very interesting question from a clinical standpoint. Having studied the work of Tetz, Engster, Drzewiecke, Deri, and Edgren, he reports thirty-two cases, divided into two classes: 1. Primary pleurisies, lungs apparently healthy. 2. Secondary pleurisies. Of the first class, he obtained favorable results in seventeen cases of the twenty-seven treated. He employed the soda salt in twenty-two grain doses, the acid in fifteen-grain doses, three or four times daily. He believes that, taking the results together, this treatment is a valuable one, in that it is not dangerous, and that it should be employed not only in simple (non-purulent), but as well in secondary pleurisies.—*Therapeutische Monatshefte*, 1892, No. 3, S. 117.

THE TREATMENT OF PNEUMONIA BY DIGITALIS.

The favorable results reported by Petresco induced DR. RUDOLF HOEFFEL to treat fifteen patients with large doses. Besides the digitalis he made use of ice-bags, cold wet-pack, occasionally leeches, and in one case, for urgent œdema, venesection; with the exception of one case, he did not use the so-called antipyretics. He does not find that these massive doses are poisonous, but that in one or two days the temperature falls and the symptoms, dyspnoea and pain, disappear; that it shortens the duration of the disease two or three days; that astonishingly frequent is the termination by lysis (eight cases in fifteen). For this valuable operation of digitalis he furnishes an explanation that the dyspnoea is relieved by the increased force of the heart, but that it is only indirectly an antipyretic, and not a direct one, as was stated by Petresco.—*Therapeutische Monatshefte*, 1892, No. 4, S. 177.

THE TREATMENT OF DIPHTHERIA BY SULPHORICINATED PHENOL.

DR. A. JOSIAS, from his observations at the Hôpital des Enfants Malades, where careful bacteriological examinations of the false membranes, exudations, and even of the tonsillar mucus were made, concludes that this remedy is a very valuable one. The formula is 20 parts of phenic acid with 80 parts

of sulphuricinate of soda. The method of procedure is: Having dried the surface and false membranes, or having removed the latter by gentle pressure of cotton upon a carrier, apply over each false membrane cotton moistened in this mixture. This application is repeated five or six times each twenty-four hours. Besides, the mouth is irrigated with lime-water, in the hope of softening or detaching the membranes, and the nourishment is prescribed with great care; and further, in markedly septic cases, oxygen, by inhalation, is employed. These applications are well borne, and cause nothing more than a sensation of heat. When the cure of the diphtheritic angina is assured, the throat is painted three or four times daily with a mixture of salicylic acid in thirty parts of glycerin, and the mouth is washed with a 3 per cent. solution of boric acid. Of the thirty-three children treated, but nine died, one of them having been admitted *in extremis*.—*La Médecine Moderne*, 1892, No. 17, p. 253.

THE TREATMENT OF DIABETES.

DR. CHARLES H. RALFE believes that in protracted cases of diabetes there should be no relaxation of the restricted dietary; whilst the extreme sensitiveness to the minutest particle of starch and saccharine food exhibited when the glycosuria is still controlled by absolute restriction of the diet tells equally against its resumption. The next consideration is whether the advantages gained by a strict adherence to an absolute diet of proteid substances by diminishing the amount of sugar in the blood, and so checking the tendency to further lowering of the assimilative processes in the body and controlling the extreme diuresis, may not be gained at a too great expense to the patient's well-being, and that some benefit may be derived by permitting a slight relaxation from a too rigid proteid dietary, and whether its too long continuance is not in itself a danger by causing the formation in excess of bodies such as the morbid products of proteid metabolism. In diabetes with a flesh diet there is a positive entrance of an increased amount of acid salts into the body which at an early period of the disease are eliminated by the kidneys, but when the bodily powers begin to fail they accumulate to a dangerous extent. Added to this is the fact that with increased feebleness the power of digesting proteid material is lessened, and consequently the risk of the formation of toxic bodies in the intestines is increased. Admitting the risks attendant upon a proteid diet, it is not believed that any relaxation from it can obviate them. Two measures will be found to be of benefit, namely, in diminishing the amount of proteid material as the patient's powers of digestion fail, and in prescribing general and abdominal massage. So far as the opium treatment is concerned, so long as the glycosuria can be removed by diet it is unnecessary. When used it should be administered by the mouth, about an hour after the meal; the preparation to be used should be a combination of liquor opii with acetate of morphia in solution, and the dose should be one sufficient to entirely control the glycosuria, remembering, however, that diabetes are singularly tolerant of this remedy. So long as opium effects a reduction in the amount of sugar, we may safely increase the dose. If, however, the sugar excretion gains ground in spite of diet and opium, it is not wise to increase the dose.—*Lancet*, 1892, No. 3582, p. 902, and No. 3583, p. 961.

THE USE OF DIGITALIS IN AORTIC DISEASE.

In the *British Medical Journal*, 1892, No. 1628, p. 542, DR. ALFRED G. BARRS, after a very thoughtful discussion, concludes:

1. In all cases of valvular disease the chief desideratum in regard to the heart itself is the condition of the cardiac chambers in respect to dilatation and hypertrophy.

2. That the presence of symptoms in cardiac disease always means failure of compensation.

3. That the condition described as over-hypertrophy or over-compensation does not exist.

4. That the dangers in aortic disease arise from the same cause as the dangers in mitral disease, namely, failure of the compensation—that is, failure of the ventricular muscle to overcome the ever-increasing work put upon it.

5. That if digitalis is safe and beneficial in mitral disease, it is equally so in aortic disease.

DR. SEYMOUR TAYLOR argues from clinical experience that there is little or no comparison between the action of the aortic valve and that of the mitral, and that the theories advanced in the preceding paper are not orthodox (*British Medical Journal*, 1892, No. 1631, p. 705).

 ERGOTININE.

In *La Médecine Hypodermique*, 1892, No. 2, p. 17, DR. FRANCK recommends the use of this active principle of ergot in place of ergotine, which is frequently inert and often untrustworthy. It is prompt, surer, and more constant, does not give rise to local accidents, and is useful in smaller dose— $\frac{1}{250}$ to $\frac{1}{120}$ of a grain. Nor, indeed, are these injections painful. Evetsky and Denslow have used it in acne. Alternating with hypodermatic injections of iron, it is useful in the menstrual disturbances of young girls. It has been used with good results in several cases of cerebral apoplexy, epistaxis, hæmoptysis, hæmaturia, hæmatemesis, and purpura hæmorrhagica. Haning has used it in suppository in hemorrhoids, and it is valuable used hypodermatically in this same condition when injected into the margin of the anus. Dujardin-Beaumetz has treated with success menorrhagias, Ducros has employed it for paralysis, and Payan for paraplegias. In lead-paralysis Hiter has obtained a cure in less than a month, giving also iodide of potassium. Payan, Allier, and Guersant, Jr., have treated paralysis of rectum and bladder, especially in old subjects, by this remedy.

 QUININE RASH PRODUCED BY VERY SMALL DOSES.

DR. FRANCIS J. SHEPHERD reports a very unusual case in the *Montreal Medical Journal*, 1892, No. 9, p. 667. A robust man, aged forty-one years, who had frequently suffered from eczema and rhus poisoning, after taking three grains of quinine suffered from marked erythema of groins, inner sides of thighs, and lower part of abdomen. The skin was swollen and tender; purpuric spots were found in the red patches. On the next day the eruption had spread to the feet, and the hands were beginning to be affected. On the

wrists was a well-marked vesicular eruption. At the end of ten days desquamation began, flakes of skin coming from the thighs, but the skin from the palms of the hands and soles of the feet came away in one piece. There was at no time any elevation of temperature or other constitutional disturbance. One month later he passed through a similar attack after five grains of this remedy.

THE DYE-TREATMENT OF INOPERABLE MALIGNANT NEOPLASMS.

PROF. R. VON MOSETIG-MOORHOF (*Wiener Klinik*, 1892, Heft 1) devotes a paper to this subject. Commencing with his first observations in 1883, using the trichlorate of aniline, he took up methyl-violet in 1890 (powder form; in ointment, ten, twenty, or a larger percentage, in diachylon or lanolin base; in solution one to five hundred, of which, one-half to three drachms, used by parenchymatous injection, every two or three days). The favorable results obtained are: 1, relief from pain; 2, improvement in general condition; 3, improvement in the mental condition; 4, improvement in the functions of the affected part; 5, lessening of the tumor. Untoward results are: 1, cedematous swellings; 2, development of foci of softening; 3, general conditions, as chilliness, fever. Ten cases are reported in considerable detail, the general conclusions being that the results have been favorable and that this method should be employed in the class of cases where radical treatment is impossible. In 1891 experiments were undertaken with carmine dissolved in water by the addition of an alkali (ammonia); the latter caused pain on injection, and was therefore abandoned. The formula recommended is 2 per cent. of carmine dissolved in 3 per cent. watery solution of soda. This solution seems to be absolutely harmless, and the pain caused by the injection is insignificant. On account of the more rapid diffusion of the coloring matter into the tissues the effect is more speedily obtained. It is likely that this remedy may, with benefit, replace the aniline colors. Three plates add much to the value of the paper.

MEDICINE.

UNDER THE CHARGE OF

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ENLARGEMENT OF THE SPLEEN IN YOUNG CHILDREN.

DR. WALTER CARR bases his paper on the observation of thirty cases in the Victoria Hospital for Children. The term "splenic anæmia" of Greis-

inger is adopted. The course, symptoms, and pathological anatomy of the cases appear to be sufficiently definite to entitle the disease to a definite name and place. The distinction must be made from the allied conditions of leucocythæmia and anæmia, and from spurious or real enlargements occurring in rickets.

Sixteen of the patients were males and fourteen females. The ages when first seen ranged from two months to two and a half years. They were usually more or less wasted. The skin was always more or less pale, with a characteristic waxy appearance and olive tint in the more severe cases. The spleen was always very hard, enlarged, and commonly to be made out on palpation. The liver was somewhat enlarged in about half the cases. There was usually some swelling of the external lymphatic glands.

In four of the fatal cases there had been epistaxis or purpura. Irregular attacks of moderate pyrexia also occurred from time to time.

In two cases a cloud of albumin was present in the urine, but the opportunity for examining this secretion was rarely afforded.

Examination of the blood in fifteen cases revealed a condition of simple anæmia. In one case only the increase in white discs approached the leucocythæmic condition after epistaxis (red corpuscles 37 per cent.; one white in thirty-three).

The author does not believe that rickets could account for the anæmia, though nearly all the cases were to some extent rickety, the diminution of red corpuscles being more marked than in that disease. The cases all run a chronic course, with death from exhaustion after hemorrhage, or from intercurrent pulmonary diseases; ten of the cases so died, six could not be traced, and thirteen either recovered completely or were steadily improving. The author does not consider the prognosis necessarily bad. Marked splenic enlargement and syphilitic taint are mentioned as two unfavorable factors.

Morbid anatomy. Necropsy was performed in seven cases; in one only was tubercle (mesenteric glands) found. No changes of importance were encountered in the liver. No enlargement of lymphatic glands of the thorax beyond what would be accounted for by the bronchitis and broncho-pneumonia present. The spleen was enlarged in every case, firm, and of increased consistence, with dark fleshy section, otherwise fairly natural in appearance. Microscopically the enlargement was seen to be simple hypertrophy with increase of fibrous elements. These appearances were the same whether the enlargement was associated with rickets, syphilis, or neither, and further resembled the spleen of ague. No definite microscopical changes were encountered in the liver or lymphatic glands.

Pathology. Ague, congenital syphilis, and rickets are considered *seriatim* as possible causes. The author's cases do not support the view that ague was a factor in causation, and a case of undoubted ague (with splenic enlargement) in a young child is quoted as presenting a marked contrast in the clinical history, and in its response to treatment, for there was marked and rapid improvement under quinine.

The evidence in favor of the connection of congenital syphilis is much stronger. In eight cases the infants were undoubtedly syphilitic, in six the evidence was doubtful, and in sixteen the evidence was negative. Seven in the first category proved fatal, and only three in the last. The author does

not share the views of Parrot as to the specific taint in rickets. His cases did not respond to mercurial treatment, and sometimes seemed to be aggravated by it. He concludes that though the connection with syphilis must be a close one, something further is required to adequately explain all the phenomena of the cases.

As regards rickets, twenty-seven of the children suffered from this condition—in four slightly, in the others more or less severely—but there are certain difficulties in the way of accepting a causal relationship: (1) In the great majority of cases no enlargement of the spleen can at any time be made out. (2) That there is no connection between the severity of the rickets and the size of the spleen. (3) In certain cases of splenic anæmia there is no evidence whatever of rickets. The theory that in rickets the spleen may be specially selected, as if the disease spent its force in that direction rather than in any other (skeleton, etc.), the author is unable to accept, though fully admitting that rickets is essentially a general disease. The author, whilst admitting a close relation with inherited syphilis, and especially with rickets, which are very probably necessary predisposing elements, inclines to the belief that over and above these some further unhygienic conditions, hitherto unrecognized, must exist. No doubt, as syphilis and rickets both predispose to splenic anæmia, a combination of the two might be supposed to augment greatly the predisposition; but, if it be true that the condition may develop apart from these two cachexiæ, any theory which requires the combination of the two for its production can hardly be satisfactory.—*Lancet* 1892, Nos. 3582 and 3583.

RENAL DROPSY.

DR. W. HAWSHIP DICKINSON made the following communication on this subject at a recent meeting of the Royal Medical and Chirurgical Society. Although as a general rule the dropsy of renal disease varied inversely with the amount of urine, there were exceptions which suggested that other considerations must be introduced. Dropsy fluid was essentially the exudation from the capillaries which constitutes the lymph. If too much of this was poured out or too little carried off, dropsy resulted. There were two obvious agencies under which fluids passed through the capillary walls, and one which was hypothetical: (1) Filtration or transudation under pressure, acting on both colloids and crystalloids, albumin as well as salts; (2) diffusion or osmosis, acting on the salts, not on the albumin; (3) a secretory action on the part of the capillary wall, which had been inferred, but of which as yet we knew but little. The products of the first two processes must be different from each other, that of the third probably different from both. Dropsy fluids varied in composition more according to their position than their cause. Effusions in the serous cavities were always highly albuminous, though not equally so; œdema fluid was very slightly albuminous, whatever the disease to which it was due. The mineral salts were in much the same proportion, whatever the place and cause of the effusion. If the albumin were the issue of filtration and pressure, these agencies were active in dropsy of every origin; if the salts were evidence of osmosis, this process was much the same in all. In obstructive suppression, where cardiac failure was

obvious and low arterial pressure inferred, though urine might be totally absent, dropsy might be equally so. With nephritis dropsy was early and marked, arterial tension was increased, and the increase was borne out by early hypertrophy of the heart. The association of œdema and increase of tension were attributed to some condition of the capillaries due to abnormality of blood, which both hindered its passage and promoted transudation. This form of dropsy was commonly conjoined with obstruction in the lungs due to inflammatory change, but only a subordinate position was assigned to the venous retardation thus occasioned. Passing to chronic conditions a contradiction presented itself, for dropsy lessened with a further increase of arterial tension. This was commonly accompanied with increase of urine, but this did not necessarily remove dropsy, as was often seen in diabetes. Cases, tables, and cardiac diagrams were adduced in support of the position that the cardio-vascular change of advancing renal disease was the antagonist of dropsy. There was shown to be much dropsy with slight hypertrophy in nephritis; little dropsy and much hypertrophy with the granular kidney so long as the heart remained undilated; and, finally, on the stretching of the heart, increase of dropsy, and often pulmonary apoplexy. Pulmonary apoplexy was insisted on as a direct and simple result of advanced renal disease, irrespective of any lesion proper to the mitral valve. The relations of lardaceous disease to dropsy were considered, with the conclusion that this form of renal dropsy was brought about differently from that of nephritis and the granular kidney. The following conclusions were presented as not admitting of doubt: 1. Osmosis alone was not sufficient to account for dropsy, whether renal or of other kinds. 2. With the access of the dropsy of nephritis there was increase of arterial pressure. With a further increase of arterial pressure as the disease became chronic, and cardio-vascular changes were established, there was diminution of dropsy. 3. Finally the heart gave way, and mitral regurgitation, pulmonary apoplexy, and increase of dropsy resulted. Further deductions, advanced less confidently, followed. The connection between dropsy and uræmia was not simple, for the most extreme uræmia sometimes existed, while dropsy was totally absent. Neither had anæmia any necessary connection with dropsy, though often associated with it.

With the increased arterial pressure of nephritis, though neither the anæmia nor the hydræmia was as extreme as in other conditions, dropsy presented itself, and it was inferred that the process was essentially due to some change in the capillaries, produced by the state of the blood, of which obstruction and transudation were consequences. It was inferred that the obstruction belonged to the capillaries rather than to the arterioles. It was, of course, admitted that the arterioles were muscular and apt to contract, especially under nervous influences; but the capillaries would seem to be especially concerned in the process under consideration. What the nature of the capillary obstruction was must be left undeclared. Changes in the blood might affect its passage in many ways. Fluids of different sorts passed through inanimate tubes with different degrees of facility; besides which, the capillaries, though not muscular, had been demonstrated to be contractile. Proceeding to chronic disease and the granular kidney, the diminution of dropsy with the further increase of arterial tension required explanation. With this concurrence we had hypertrophy of the left ventricle, thickening

and narrowing of the arterioles, and increase of urine. It was submitted that the constriction of the smaller arteries must cut off the blood from the capillaries, and presumably lessen pressure in them and exudation from them. Further, that the thickening of the ventricle must necessarily increase its expansile power and suction action, and thus draw upon the pulmonary circulation and relieve the veins and interstices. Next came the beginning of the end in the yielding of the ventricle, regurgitation, increase of dropsy, and often pulmonary apoplexy. Putting aside lardaceous disease, the points of resemblance and of difference between renal and cardiac dropsy came into prominence. In both the accumulation, as is well known, was essentially, however modified, that which exuded from the capillaries and constituted the lymph. Under heart disease there was diminished absorption without any presumption of increased exudation, or not to any important extent. Under kidney disease there was increased exudation without any necessary or constant diminution of absorption. Both were essentially connected with modifications of blood-pressure—in one from obvious obstruction to the venous return, in the other from some presumably obstructive condition of the capillaries, which was attended with enhanced exudation from them, and associated with increased pressure within the arterial system.

DR. GEORGE JOHNSON believed that the obstruction was in the arterioles. It had been abundantly proved that these were the regulators of the blood-supply to the various tissues and organs. He believed that the proximate cause of acute renal dropsy is the active elimination of retained urinary liquids and solids by a vital secretory process—an eliminative process intermediate, as it were, between the passive exudation which results from cardiac disease, and the more active *inflammatory* exudations which often occur during the progress of Bright's disease.

After referring at some length to the evidence derived from experiments as to the function of the arterioles, he concluded as follows:

There is proof that the arterioles can impede and arrest the circulation, but no evidence that the capillaries have that power.

There is no evidence of such increased intra-capillary pressure as would explain the occurrence of renal dropsy.

Capillary contraction, if proved to exist, would not explain the occurrence of dropsy. Intra-capillary pressure has probably as little influence upon renal dropsy as upon the inflammatory exudations which occur during the progress of the disease.

Acute renal dropsy is best explained by the active elimination of retained urinary excreta, both liquid and solid.

The dropsy which occurs in the final stage of chronic renal disease is often, as the author of the paper states, a result of heart failure; therefore truly cardiac, though not primarily of cardiac origin.

DR. PYE-SMITH admitted the weight of Dr. Johnson's views, but held that the author had raised a much wider question than the part played by the arterioles, which was now established beyond controversy.

He agreed with the author that cardiac dropsy was entirely due to pressure. Osmosis was a matter of passive effusion, and quite independent of pressure.

The explanation of cardiac dropsy was clear, but it did not serve to explain renal dropsy. In that disease there were really two separate dropsies—the one found in association with the large red or white kidney, the other the dropsy of the later stages of granular kidney. The later one was “hydraulic” and cardiac in origin, coming on when the arteries were soft and the cardiac hypertrophy had given way to dilatation. The early “renal” dropsy could not be explained in the same way. It might have some connection with the secretory power of the capillary endothelium. He thought there were several reasons for regarding its origin as something different from cardio-vascular disturbances. In his opinion, the early dropsy was probably not a dropsy at all, but an inflammatory effusion associated in origin with the other inflammatory effusions met with in Bright’s disease. The interstices in the areolar tissue were as truly lymph spaces, and as such were liable to inflammation of the renal kind, as the larger lymph spaces of the pleuro-peritoneal cavity.

DR. DOUGLAS POWELL agreed with Dr. Pye-Smith that the late dropsy of renal disease was in most cases a direct result of heart failure. He could not admit pressure as a direct cause of dropsy in renal disease, seeing that, during the period of highest tension, dropsy was not present.

He thought renal dropsy might be better regarded as a perversion of the osmotic circulation normally going on outside the capillaries, an excessive output including watery and saline materials which was supplementary to the diminished flow from the kidneys, and which had been found to contain some of the special salts normally secreted by the kidneys.

He could not accept the view of the inflammatory nature of the œdema, which was not supported by clinical evidence or by the characters of the fluid itself.

DR. BROADBENT could not admit that renal dropsy was ever, or in any degree, inflammatory. Were it so, it would probably be diffuse and less influenced by gravity. He had long held that the resistance which gave rise to the physiological exudation of material for the nutrition of the tissues was situated at first in the capillary system, and not primarily in the arterioles. The additional obstruction, therefore, which gives rise to the dropsy in renal disease was also resident in the capillaries, and caused by some impurity in the blood. The late dropsy was undoubtedly due to heart failure. Without definitely accepting Dr. Dickinson’s explanation of renal dropsy, he was greatly disposed to regard it as, in all probability, correct.

DR. SANSOM could not agree with the general conclusion of the previous speakers, that renal dropsy could be explained by dynamic causes. Dr. Wooldridge had demonstrated that dropsy would not occur in dynamic conditions of the blood very carefully brought about, unless some small amount of lymph products were injected into the blood. He urged that it was not difficult in renal disease to assume that resorption was likely to take place in view of an impeded excretion.

ENTERIC FEVER COMPLICATED BY SUPPURATIVE EPIDIDYMITIS.

GIRODE (*Archives Gén. de Méd.*, vii. 29, i. p. 43) has reported the case of a man, twenty-nine years old, in which, on what was estimated to be the

twenty-third day of an attack of enteric fever attended with pulmonary symptoms, the right epididymis was observed to be swollen, red, and hot. There was no evidence of the existence of urethritis; urination was normal. The pulmonary manifestations increased in intensity; death took place on the twenty-ninth day, from asphyxia. At the autopsy, swelling and ulceration of the agminated glands of the small intestine were found; the mesenteric glands, the spleen, the liver, and the kidneys were enlarged. The lungs presented the appearances of broncho-pneumonia; section gave exit to a small quantity of pus from some of the smaller bronchial tubes; there was no tuberculosis. The testicles were normal, but on the right side an interstitial epididymitis existed, with foci of suppuration. Cultures of the pus, as well as of fluid obtained from the spleen, resulted in the development of the bacilli of enteric fever; inoculation of two guinea-pigs was followed by death and the reproduction of the same organisms in the fluids of the animals. The evidence, positive and negative, points to the occurrence of bacterial emboli in the epididymis, with inflammation and suppuration.

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A CASE OF GUNSHOT WOUND OF THE ABDOMEN.

KRUNAR (*Indian Medical Gazette*, vol. xxvii., No. 2) reports the following case in which the œsophagus or stomach was manifestly wounded, but the bullet lodged in some locality where it produced no further mischief. The patient had a depressed wound with inverted edges, one-fourth of an inch in diameter, situated on the left side, between the sixth and seventh ribs, two inches outside of the anterior median line. There was slight contusion about the wound, and below it emphysematous crackling. There was a somewhat larger hole at a corresponding point in the patient's coat, but this seemed to have been caused by burning, and no part of the fibre could be found in the wound.

Immediately after admission the patient vomited about a pint of blood, this being the only emesis. The wound was dressed antiseptically, perfect rest enjoined, and ergot and sulphuric acid were given every three hours. Two

hours after admission the patient's temperature rose to 102°, but gradually subsided, becoming normal on the third day, and remaining so with one day excepted.

For the first week nothing was given by the mouth, except small bits of ice for the thirst. Nutrient enemata of milk and soup were given in small quantities at short, regular intervals.

On the eighth day liquid food was retained and was continued for ten days, solid food being taken and retained after that time. The ergot mixture was discontinued after two days, no more medicine except a cough mixture being given. The wound and its discharge remained aseptic, and no foreign body was ever discovered in the stools, which were perfectly healthy and regular, except at first, when they were slightly blood-stained. The patient was discharged one month and four days after admission entirely cured.

THE TOPICAL TREATMENT OF CYSTITIS BY CORROSIVE SUBLIMATE.

GUYON (*Annales des Mal. des Org. Génito-urinaires*, 10e année, No. 1) arrives at the following conclusions, based upon his observations and the results obtained by the topical application of corrosive sublimate in the following twenty-six cases of cystitis:

Often cases of tubercular cystitis, five were greatly ameliorated; two of these he would call cured if it were not for the difficulty of exact diagnosis and the well-known tendency to relapse in all conditions of tubercular origin; and he lays special stress upon the fact that in these cases the corrosive sublimate was well borne, the reverse being true of all other medicaments whose topical application he had studied. Of seven cases of gonorrhœal cystitis, four were cured, one ameliorated, and two were unsuccessful. Two cases due to prostatic enlargement were speedily ameliorated, and one case of pseudo-membranous cystitis was cured.

He found that an inverse ratio exists between the number of micturations and the capacity of the bladder, and that it has a physiological, not an anatomical capacity. This led him to use instillations instead of lavages, drops instead of drachms, and he obtained by these methods, using solutions of equal strength, entirely different results. He draws the following conclusions from the work of Hallé regarding the antiseptic power of corrosive sublimate: It is powerful against microbes of the air; weaker against the microbes of the urine than against the ordinary pyogenic microbes; and very weak in its antiseptic power over purulent urine, only acting when used in enormous doses. He found the nitrate of silver less powerful over the microbes of the air; but greater over the microbes of the urine than on the ordinary pyogenic microbes, though in neither case was it as efficient as the sublimate, while the same is true of its power over the microbes of purulent urine when used in proportionate doses. With regard to the efficiency of the sublimate in destroying the bacillus of tuberculosis, he believes that the great amelioration amounting almost to absolute cure, in the cases of tubercular cystitis, confirms the belief that it is the most active agent we possess, and the culture-experiment of Hallé demonstrated the fact that the presence of sublimate in a gelatin culture, even in the form of an albuminate, prevents the growth, although it does not destroy the tubercle bacillus.

With regard to the effect of these germicides upon purulent urine the experimentation shows that it is impossible to apply either remedy with hope of success, where there is purulent urine. He gives the following as his method of treatment. He believes that instillations should be substituted for lavages, as the sensibility of the bladder both in its normal and pathological conditions is dependent upon the distention of its mucous membrane, and he finds that by this method he can more easily increase the strength of his solution while lengthening the time of its retention. The instillations are made in the ordinary manner; the fluid should be introduced into the posterior part of the urethra, as this part always participates in any cystic inflammation. The solutions should be made of boiled distilled water, and must be made without alcohol. The bladder must be void of urine, a catheter being used if required. The first instillation should not exceed 20-30 drops of a 1 : 5000 solution, and may be increased in quantity to one drachm, and in strength to 1 : 1000. This he considers the limit of safety, although the dosage both as to quantity and strength is entirely relative, and depends on the sensibility of the bladder, excessive pain demanding weaker solutions, while inability to retain the solution is the indication for a lessened quantity.

In all his observations he has seen no harmful results from this method of treatment.

RETRO-PHARYNGEAL ABSCESS IN INFANCY, AND ITS TREATMENT.

Four cases of acute retro-pharyngeal abscess are reported by POLLARD (*Lancet*, Feb. 13, 1892), and the following operation described :

"An incision about an inch in length, and about an inch below the mastoid process, was made along the posterior border of the sterno-mastoid. After the fascia covering the muscles in the floor of the posterior triangle was exposed, a cautious dissection with blunt instruments was made behind the deep vessels and nerves of the neck until one finger placed in the wound almost met another placed in the pharynx. A director, guided by the finger in the pharynx, was then thrust into the abscess, and the opening enlarged by passing a pair of dressing forceps in and forcibly separating the blades. A drainage-tube should be inserted, and care should be taken that it does not slip out of the abscess cavity."

DESMOIDS OF THE ABDOMINAL WALL.

BODENSTEIN (*Münch. med. Wochenschr.*, xxxix., No. 1) adds to the literature of this subject and the 100 cases collected by Ledderhose, 21 cases, reporting the following case which came under his care. The patient, during pregnancy, felt a distinct tenderness over the uterine region, but ascribed it to her condition; but on observing, after the birth of her child and the delivery of the placenta, that there still remained a large tumor in that region, she sought the hospital. Supposing the tumor to be abdominal an incision was made in the linea alba, when it was discovered that the tumor lay in the abdominal wall, though closely adherent posteriorly to the peritoneum, from which it was with difficulty dissected. The tumor weighed about three and a half pounds and gave a peculiarly harsh sound when cut with a knife. The microscopical structure showed the tumor to be of a dense fibrous char-

acter, similar to connective tissue. In the 21 cases he collected in addition to those of Ledderhose, of 18 fibromas, 12 had their point of origin in the recti and their sheaths; the other 6 arising from the oblique muscles. The other 3 were sarcomatous in character, and apparently fibro-sarcomas springing from and directly connected with the recti.

THE SCHWALBE TREATMENT OF HERNIA.

STEFFEN (*Correspondenzblatt für Schw. Aerzte*, xxii., No. 2) discusses the report of Heidenthaler in regard to the results obtained in Billroth's clinic in the treatment of herniæ by the method of Schwalbe. He says the poor results are due : 1. To the shortness of the treatment. 2. To the fact that the injections were made without sufficient intervals intervening, and therefore produced an acute inflammation and inflammatory products that were easily absorbed. 3. They were too few in number and too near together. The treatment is one more applicable to private practice and dispensary work, where patients can be under treatment for a long time with long intervals between the injections, producing a chronic inflammation with the production of connective tissue, than it is to hospital practice where the patient occupies so much time and where the methods of Macewen and Bassini produced quicker results. He describes his own method of procedure, with which he has obtained favorable results with the treatment of Schwalbe.

THE TREATMENT OF INTRA-MAMMARY ABSCESSSES.

HACHE (*Rev. de Chir.*, 12e année, No. 3) recommends the following as a means to procure the rapid healing of these abscesses :

1. After antiseptic precautions the most important procedure, as in all other abscess cavities, is the procuring of perfect drainage.

2. The compression, uniform and firm, of the gland is the best means to accomplish this end, the position or declivity of the incision being of little importance.

3. To produce this uniform and sufficient pressure concentric compression directly of the gland should be joined to the classic method of pressure against the thorax.

4. Drainage-tubes should be avoided as much as possible, as they render the compression painful and retard the healing.

5. Where the abscess is superficial and only covered by a thin layer of tissue, it should be incised in this point. The thinness of the walls renders the use of drainage-tubes unnecessary. He reports four cases in which this method of treatment by compression produced rapid cures with restoration of the secretive function.

TUBERCULAR DISEASE OF THE SHOULDER-JOINT.

MONDAN and AUDRY (*Rev. de Chir.*, 12e année, No. 3) give the following *résumé* of the conditions found to be present in 43 cases of tubercular disease of the shoulder-joint which they have had under observation, and in 32 cases have made anatomical studies of the resected portions, as also the conditions found present at the operation. Tubercular disease of the shoulder in adolescents and adults is osseous in character and originates in the humerus, although

lesions of the surrounding tissues are not rare. The tubercles are most frequently found in the epiphysis, generally in the head or surgical neck, and are multiple. They may be central, but the proportion is nearly two to one in favor of the peripheral lesion, where they develop beneath the cartilage or in the cervical groove. The dominant form of tubercle is the caseo-fungous. Sequestra are not rare in the humerus, nor is the infiltration by tubercle of its head. There are two distinct forms of disease: the one moist, rapidly evolved with or without fistulæ; the other dry, with a tendency toward atrophy and ankylosis, slow in its course of development, and characterized by constant pain. They believe that in every fifty cases of tubercular arthritis there is one of shoulder involvement. The age at which this disease may develop is not fixed. In their cases it ranged between eight and seventy-one years, although the majority of the patients were about twenty, or at the age corresponding to the osseous union of the epiphysis and diaphysis, which is the latest of unions. They found that traumatism has no direct influence in causing the outbreak of disease, as in 43 cases only 9 could substantiate a history of traumatism. In marked contrast to the historical description of white swelling, which is the attribute of all tubercular joint disease, they find that in tubercular arthritis of the shoulder there is always marked atrophy of all the muscles, but especially of the deltoid, which is markedly atrophied and suffers a loss of function, if it is not entirely destroyed, its thinness permitting the direct palpation of the head of the humerus. The differential diagnosis is to be made from rheumatoid arthritis, the history of the case and family tendency are the best guides, while the fact that 90 per cent. of these cases are tubercular makes that the more probable form.

THE ENUCLEATION OF GOITRE.

REVERDIN (*Revue de Chirurg.*, 12e année, No. 3), writing on this subject, says: "It must not be forgotten that despite the amelioration in statistics, thyroectomy is an operation that often leaves a cadaver in the hands of the operator;" and continuing, he formulates these as the indications for operation: "When iodoform and all other recognized effective medicinal treatments have done all they can for the symptoms which continue rapidly or slowly to increase, as suffocation and intermittent or persistent pain, surgical intervention is indicated." He reported fourteen cases, in which the sexes were represented by five men and nine women. The ages varied from twenty-one to fifty-eight years, thirty-five years being the average. The position of the goitres was ten of the right lobe, and two each of the isthmus and the left lobe. He suggests as a hypothetical reason for the predilection shown for the right lobe, the greater liability of congestion on that side when there is any effort as a cause for it, present in the system. He classes the goitres from the clinical aspect as five parenchymatous, six cystic, and three adenoid. He considers enucleation preferable to partial extirpation, his experience in this series of cases having demonstrated the greater utility and better results without sequelæ of the former method, and although in this series he did seven enucleations and seven partial extirpations, he draws attention to the fact that six of the partial extirpations were done in the first seven cases, and that since his experience has taught him the difference, he prefers to perform

the enucleation. Comparing the duration of time in the two operations, and the length of convalescence, he finds that the enucleations averaged twenty-six minutes, including dressings, and healed in seven days, while the partial extirpations required sixty-two minutes and only healed after fourteen days. All his patients recovered, except one; this one was a woman, aged seventy years, whose trachea was so involved and softened by disease that even tracheotomy could not save her, and this case he believes reflects no discredit either upon the operation, its method, or the surgeon. He considers the operation one of necessity rather than of choice, and believes that the surgeon should always attempt enucleation, as it has the advantage of being the shorter operation, and produces the more rapid cure without the danger of sequelæ.

CATHETERIZATION OF THE BILIARY DUCTS.

After a lengthy discussion of the normal anatomical structure and the pathological changes produced in the biliary ducts and their relations to catheterism, TERRIER and DALLY (*Revue de Chirurg.*, 12e année, No. 2) come to the following conclusions: 1. In general the catheterization is easier under pathological conditions, especially when the ducts are dilated by a stoppage in the valves or at the distal end of the cystic canal. 2. Nevertheless, in many cases, owing to the curvatures in the canal, the persistence of the valves or the opening of the duct upon the lateral wall of the sac, the catheterism is difficult. 3. Often the difficulty is insurmountable, often there is none. 4. Rules for the passage of the catheter are impossible, owing to the variations in the anatomical relations. The only way is to attempt the catheterism with a clear idea of the normal relations for a guide. 5. Forced catheterism, even with a finger externally to direct the instrument, is difficult and in all cases dangerous. 6. The treatment is not well enough understood as yet for its value to be appreciated. 7. The instruments to be used are olive-pointed bougies and Bénique's catheters, with or without stylets. Liver catheters are of rare use. 8. In all these operations strict antisepsis must be observed.

THE TREATMENT OF GUNSHOT-WOUNDS OF THE SPINAL COLUMN.

VINCENT (*Rev. de Chir.*, 12e année, No. 2) divides these wounds into three classes, and counsels surgical intervention, under antiseptic precautions, in all cases. His classes, with their treatment, are as follows:

1. "Simple compression of the cord by an extravasation of blood by a fragment of bone or by the projectile situated outside of the medullary canal." This is admittedly the most favorable condition for surgical intervention, and he believes that in every case the removal of the projectile from the neighborhood of the spinal canal exerts a beneficial influence upon the inflammation.

2. "The projectile has passed completely through the vertebral column, injuring the cord." If this diagnosis could be established there would be little need of operation; but in the generality of cases it cannot be, and there is usually some foreign body or splinter of bone remaining in the canal, and he advises always the division of the soft parts and a thorough exploration of

the conditions present. There is but one contra-indication, and that is a coexistent visceral lesion that endangers the life of the patient.

3. "The projectile is entirely or partially lodged in the spinal canal." Although success in these cases is rare, he believes surgical interference, under antiseptic precautions, does not aggravate the danger and justifies surgical operative measures on the following grounds:

The presence of a foreign body in the medullary canal is a certain cause of irritation leading to myelitis and meningitis, and many patients recovering from the paralyses succumb to cysto-nephritis or septic complications and nutritive derangements created by this myelitis. By the removal of the foreign body and the antiseptic cleansing of the wound in the spinal column, the development of these inflammatory complications is hindered, if not entirely prevented.

In conclusion, he says that surgical intervention has contributed to save many wounded in these cases, that are in prognosis so very grave, and that no matter what the injury, if there exists no visceral lesion surgical interference is indicated in all cases where the lateral or posterior situation of the injury makes it accessible—even trephining the canal if it is necessary to remove a foreign body.

'COMPOUND FRACTURE OF THE SKULL AND WOUND OF THE ARM CENTRE.

WILLIAMS details (*New York Medical Journal*, vol. lv., No. 2) the case of a male negro, aged twenty-three years, who, two days before admission to the hospital, had received a blow on the right side of the head, producing a compound fracture of the right parietal bone with comminution and depression at the centre of the Rolandic region. Temporary unconsciousness followed, with paralysis of the left arm below the elbow. There was slight motion of the shoulder and elbow. Intelligence was unimpaired and sensation was normal.

The depressed bone was circular in shape and about as large as a silver half-dollar. Thirteen fragments of bone were removed; some of these were imbedded in the brain. There was some loss of brain substance. After cleansing, a rubber drain was introduced, the wound closed with catgut sutures, and a sublimate dressing applied.

After recovery from the anæsthetic, abnormal sensations were complained of in the left arm and leg. The wound suppurated. Slight motion appeared in the fingers of the left hand on the fourth day after operation. During the next six days the patient was somnolent with occasional delirium, and had at times a severe tremor of the whole body. Constant pain was complained of in the back of the neck. Hernia cerebri developed, and the mass was shaved off three times. Elastic pressure was applied, and no further trouble was experienced. On the forty-seventh day the tongue was seized with clonic convulsive movements. The dressing was removed and the gauze packing withdrawn, when the spasm ceased at once. Three days later clonic spasms of the left arm and leg occurred, lasting fifteen minutes. The condition of the patient when discharged was as follows: Motion at shoulder almost normal; can flex the elbow and wrist; pronation and supination imperfect; can flex the fingers, but cannot completely extend them; fingers all partially anæ-

thetic, but not analgesic; perception of heat and cold normal; tactile sense impaired; picks up articles with difficulty; marked rigidity of muscles of left arm and forearm, which becomes more marked when voluntary motion is attempted; can stand on left leg for a few moments only; knee-jerk and ankle clonus increased on this side. The patient is working, and is able to manage a dump-cart.

A CASE OF INTESTINAL OCCLUSION BY TORSION OF THE LARGE BOWEL;
LAPAROTOMY.

VILLAR reports (*Journal de Médecine de Bordeaux*, 1892, No. 4) the following case: A deaf-mute, female, aged about forty years, of very constipated habit, on the 16th or 17th of August evinced distress in the abdomen. Purgative medicines were given without effect. Enemata likewise failed to cause an action of the bowels. One week later, the patient was sent to the hospital in the following condition: The expression was drawn, the tongue was rather dry, the pulse fair, the abdomen irregularly distended. Operation was decided upon.

After anæsthesia the parts were thoroughly cleansed, and an incision made in the linea alba from just below the umbilicus to just above the symphysis pubis, and the peritoneum opened in the usual manner. The intestinal mass was rapidly and thoroughly examined, beginning at the cæcum; first the small intestine, and then the large intestine was inspected. The former seemed normal, the latter was much distended. Behind a voluminous loop was seen a large fibrous band, which was resistant and did not permit of the introduction of a finger between it and the bowel, which it constricted. It was observed that in rotating the loop the band disappeared, only to return again on replacing the bowel as it was found, demonstrating, therefore, occlusion of the bowel from torsion.

The volvulus was at the level of the sigmoid flexure, which is the most frequent seat of torsion.

The sigmoid flexure had described a rotation from left to right, embracing the colon, and forming a close knot, which would have been difficult to remove except by direct manipulation. The large intestine formed the constricting band. Fecal matter was passed *per anum* when the intestine was untwisted. The bowel showed a tendency to resume its former twisted condition, owing to the low position of the transverse colon. The abdominal incision was, therefore, continued upward, and the transverse colon fixed to the abdominal wall by seven heavy catgut stitches, on a level with the greater curvature of the stomach. The abdominal wound was closed, and iodoform dressings applied. The temperature did not rise above 37.8° C. There was no vomiting, and the patient had a natural stool. A little soup was given by the mouth. The case progressed favorably until the evening of the fourth day, when the temperature rose to 38.9° C. The patient gradually became weaker, and died on the seventh day. The abdomen had remained flaccid, and was free from pain on pressure. The author does not think the operation is responsible for the death, but believes life would have been preserved by earlier interference.

In concluding, medical treatment is advised first, but surgical measures are

not to be too long delayed. Attention is also called to this operation in any case of enteroptosis.

REMOVAL OF A CALCULUS FROM THE VERMIFORM APPENDIX; RECOVERY.

PINNOCK reports (*Australian Med. Journ.*, vol. xiv. No. 1) the case of a man, aged nineteen years, who was suffering from the usual symptoms of perityphlitis. Belladonna was applied externally and administered internally, and under this treatment the patient improved for some days, but became worse again, having obstinate constipation and vomiting matter with a fecal odor. An exploratory operation was decided upon. This was done seventeen days after the beginning of the illness. The incision was made in the linea alba large enough to admit the hand. Numerous adhesions were encountered, and a small cupful of pus and a quantity of feces evacuated. The vermiform appendix was found bound down by adhesions. It was found to contain a calculus, which was removed. A glass drainage-tube was inserted, and the wound closed with deep silver-wire and superficial horse-hair sutures. At the end of fifty hours a rubber tube was substituted for the glass one.

The calculus weighed fourteen grains, measuring half an inch in diameter and six-sixteenths of an inch in thickness. It was formed of phosphate of lime, with some oxalate of lime, and was arranged in concentric layers.

Reference is made to two similar cases, recorded by other observers.

Of 125 cases of ulceration of the appendix examined by Fenwick, a concretion, mass of feces, or other foreign body was found in but 55. In 47 of these, 28 were concretions, 14 hardened feces, and 5 seeds or shell. In 200 dissections, Ferguson, of Toronto, found foreign bodies in the appendix 15 times.

OTOLOGY.

UNDER THE CHARGE OF

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IMPACTED CERUMEN INVADING THE MASTOID PROCESS AND PRODUCING FACIAL PARALYSIS.

DR. JAMES W. DALBEY, of Cedar Rapids, Iowa, found in a man fifty years old, sent to him for examination, "the right external auditory canal completely filled with a black, hard mass of inspissated cerumen. . . . The impacted cerumen was removed by a current of warm water and the use of the curette and hook, revealing complete destruction of the membrana tympani and disappearance of the ossicles [probably from an old purulent

process in the ear.—REV.]. There was also a sinus opening from the auditory canal into the mastoid cavity. From the mastoid cavity—there having taken place absorption of all its cellular elements—a large quantity of wax, desquamated epithelium, and a small quantity of pus were removed. Immediately a marked improvement in the facial condition ensued. In the course of four or five days the muscles of the face contracted normally. The pressure on the seventh nerve was supposed to have occurred “in its passage through the mastoid.” The facial paralysis had lasted two months, when finally relieved.

NYSTAGMUS IN AURAL AFFECTIONS.

DR. MICHAEL COHN reports a case of the above-named rare occurrence (*Berliner klin. Wochenschrift*, 1891, No. 43). In Baginsky's public clinic for ear, throat, and nasal diseases, in Berlin, a woman, forty-six years old, presented herself for relief of a discharge from the left ear, associated with attacks of vertigo and nystagmus. Gentle pressure on the tragus of the affected ear, syringing the ear, and compression of the air in the external auditory canal with an inflation balloon instantly produced vertigo and nystagmus. When the canal was lightly filled with cotton no form of pressure on the column of air in the auditory canal was able to call forth the aforesaid phenomena.

OPERATIVE MEASURES FOR THE RELIEF OF IMPAIRED HEARING.

DR. E. B. DENCH, of New York, after reviewing the work in the above named direction of Politzer, Kessel, and Miot, in Europe, and Blake, Sexton, and others in this country, gives his own experience in some interesting cases (*Archives of Otolaryngology*, vol. xx. No. 1). In Case I., a man twenty years old, the stapes was freed, by incisions around its head, from a dense fibrous tissue formed as a result of a chronic purulent otitis media. The hearing was improved and the discharge ceased.

In Case II., a boy of twelve, the border of an old perforation covered and bound down the incudo-stapedial joint. Severance upward, one-sixteenth of an inch, was followed by improved hearing, as the stapes was free to vibrate in and out of the oval window.

In Case III., a girl of sixteen, the malleus, which was bound down to the promontory in consequence of adhesions following a chronic purulent otitis media, was cut loose. The hearing increased a little for the watch.

Case IV. In a man, twenty years old, it was found that an acute purulent otitis media had destroyed the entire membrana vibrans, and that the malleus handle was drawn backward and upward toward the head of the stapes, where it had become attached by a firm adhesion. “Division of the band rendered the hearing of articulate speech in this ear practically normal.”

In none of the cases reported was there any inflammatory reaction, and the pain was insignificant. “It seems but just to our patients, therefore, in any case where there is a possibility of improvement by simple operative measures not attended with risk, to give them the benefit of the doubt, after explaining that, in any given case, the amount of improvement is largely a matter of conjecture. In cases, also, not dependent upon suppurative disease,

but upon catarrhal inflammation with the formation of adhesions within the tympanic cavity, it seems that we are justified in opening the tympanic cavity—using antiseptic precautions—and to attempt to liberate the ossicular chain either by disarticulation of the incudo-stapedial articulation, the division of existing adhesions or by *brisement forcé*, the latter after the method of Miot."

OPENING THE MASTOID THROUGH THE EXTERNAL AUDITORY CANAL.

DR. HESSLER, of Halle-am-Saale, at the Tenth International Medical Congress, reported, by request of the committee, upon the question, "Can the opening of the mastoid from the external auditory canal be considered as good as other methods in vogue?" (*Archiv f. Ohrenheilkunde*, Bd. xxxi. Heft 1). He first gives an account of the four usual methods of opening the mastoid and the middle ear, viz : That of Schwartz—the oldest and the most usual—consisting in chiselling off successive layers from the corticalis of the mastoid until the antrum is reached. 2. That of Wolf, consisting in penetrating the bony partition between the antrum and the external auditory canal by successive layers after the soft parts are removed, just as though the auditory canal were to be widened posteriorly. 3. The method of Küster, consisting in making an opening in the posterior wall of the auditory canal, in cases where some of the membrana and the ossicles are still retained, as far away from the membrana as possible. However, if the drum-cavity is filled with granulations and the membrana and ossicles largely or entirely destroyed, Küster advises carrying his incision through the bone into the drum-cavity, so as to remove with a sharp spoon all morbid material during direct inspection. Then a drain or an iodoform tampon is inserted. He discards repeated or prolonged syringing after the operation, as suppuration is greatly diminished by the operation. 4. The method of v. Bergmann is then considered. This consists in making a long, crescentic incision from above and in front of the auricle backward and downward, and then loosening the periosteum from the entire osseous auditory canal. Beneath the linea temporalis the thick bony partition between the auditory canal and the middle cranial fossa is penetrated with a chisel as far as the bony annulus tympanicus, without, however, entering the cranial cavity. Now, by means of the chisel the incision is carried further backward toward the mastoid process, in order, from here in an oblique direction, to penetrate that part of the pars tympanica forming the posterior wall of the bony auditory canal. Great care is exercised to avoid too deep a penetration and also injury of the facial canal; then tamponade of iodoform. In two days drainage-tube inserted in the depths of the drum-cavity.

All operators, with their different methods, have obtained successful results. It seems, therefore, that no one method is sufficient for all forms of tympano-mastoid disease, but that the methods must vary with topographic-anatomical variations.

Wolf's method is not much used, and is difficult. The narrow limits of the field of operation make it hard to avoid injury to adjacent parts, and subsequent irrigation cannot be thoroughly carried out. It is indicated (1) for subperiosteal removal of exostoses and hyperostoses of the auditory canal; (2) in caries in the upper and back part of the auditory canal; and (3) when-

ever the transverse sinus extends so far forward into the field of the operation that the operator is forced to work very far forward on the posterior wall of the auditory canal in order to avoid the sinus.

Küster and v. Bergmann object to the method of Schwartze because they claim that by chiselling alone only the antrum is reached; that this can have little beneficial effect upon a profound osseous suppuration in the middle ear, and that the surgeon must do more than keep up, as after-treatment, an untiring antiseptic syringing of the tract of the operation. Drainage, and letting the operated field alone, is recommended by Hessler. Syringing is objected to as dangerous, because it does not prevent the entrance of the disease into the brain-cavity, but in many cases it perhaps favors it. It is urged that the injected stream of boric acid or carbolic acid solution may force septic material through non-suppurating though softened bone-tissue surrounding the brain. Also, the leaden peg is to be abandoned, as it may interfere with drainage, promote the growth of polypoid granulations, and cause great vertigo and even vomiting.

A combination of the methods of Schwartze and v. Bergmann answers all the demands of aurists and surgeons. Every chiselling of the mastoid should be begun in the manner of Schwartze, and will be sufficient if the caries is limited to the mastoid process and the antrum. If it extends further forward between the lamellæ of the squama, then the middle ear must be opened after the method of v. Bergmann. Thus, a free communication may be established between the antrum, the attic space, and external auditory canal.

Hessler states that before Küster's work was published he had in six cases removed the entire posterior wall of the bony auditory canal as far as the tympanic cavity, and had also removed with it a portion of the squama. This was done three times in acute and three times in chronic purulent otitis media with caries in the mastoid process, and once in connection with cholesteatoma in the antrum and middle ear. In all cases cure finally ensued.

A CASE OF ABSCESS OF THE TEMPORAL LOBE; RECOVERY.

DRS. A. BAGINSKY and THEO. GLUCK report a case of abscess of the temporal lobe, due to purulent otitis set up by the insertion of a pea in the ear of a boy five years old (*Berliner klin. Wochenschrift*, No. 48, Jahrgang xxviii.). The history of the case revealed the following facts: The boy, after having put the pea in his ear, was taken to a children's hospital in Berlin, where vain endeavors were made to remove the pea, by syringing. Some days later the patient was brought back to the hospital with an otorrhea. An aurist, Dr. B. Baginsky, now examined the ear, detected the pea lying upon the membrana, and removed the foreign body with a small hook. The slight discharge ceased under treatment, in a few days. Two or three weeks later the child manifested fever and headache, according to the parents' statement, which symptoms became worse at night. Suddenly, during an attack of fever and headache, there occurred a clonic spasm, with partial loss of consciousness. The family physician discovered the following conditions: A somewhat *slow and irregular pulse*, intense headache on the side of the head corresponding to the wounded ear, slight retraction of the belly, slight twitch-

ing in both hands and feet, with moderate opisthotonus, and slight somnolence.

Examination of the ear revealed absence of all suppuration, and that there was a large perforation in the membrana. Frequent repetition of these symptoms led to the suspicion of an incipient meningitis, and the child was again taken to the children's hospital, about three weeks after the pea was introduced into its ear.

Dr. A. Baginsky now examined the child most carefully, but found no essential cerebral disturbances. For nine days there was nothing abnormal observed in the patient. Then, however, it was observed for the first time that the left pupil—the side of the affected ear—was somewhat smaller than the right. However, both pupils reacted normally; but, at the same time, the miserable expression and the *emaciation* of the child became striking. Then irregularity and slowness of the pulse—sixty-four in a minute—were observed, while the temperature remained normal, as it did throughout the *entire* illness. The child began to complain of headache, which could not be localized. Four days later it was discovered that the left temporal region was sensitive to the lightest touch. But there was nothing abnormal discovered in sensibility or mobility which would have to some extent indicated a central lesion. Good, and then bad, days succeeded for five days more, the pulse falling to fifty-eight, then rising to seventy-nine, to fall again to sixty-eight, the respiration being but slightly affected. Now, about six weeks after the injury to the ear, the condition of the patient suddenly changed. The child began to sleep badly, was restless at night, and complained of great headache, not localized, however. His appearance was wretched, pulse irregular and slow, and at times his sensorium was observed to be affected. He voluntarily lay in bed; his hearing appeared to be good, but his answers were short and indistinct, and, finally, in the course of a day the child developed a condition of peculiar apathy, and lay in bed with his arms and legs drawn up to his body. The neck was stiff, and the head was thrown back; the pulse was very irregular, and sank as low as fifty-two; the sensorium was clear for only a few moments at a time; the child cried out loudly from time to time, but was mostly in deep sleep. There was no engorgement of the papillæ. Abscess in the brain was now plainly diagnosticated, seven weeks after the injury, but there was nothing beyond analogy to place its seat in the temporal lobe. There was no paralysis nor even weakness of the arm on the opposite side.

Dr. Gluck, by request, performed the operation for opening an abscess in the temporal lobe, and found a large quantity of pus in an abscess in the temporal lobe of the left side. The child at no time had fever; he began to play the same day. Soon after the operation his pulse began to increase in frequency, and reached eighty-four the second day after the operation, and the respirations were normal. A few days after the operation a slight facial paralysis was observed on the left side, which, however, soon disappeared. The child also would repeat automatically twenty, thirty, and forty times a single word which had been said to him. The left ear still showed a slight discharge and a large perforation in the membrana. Otherwise the child was entirely well three months after the operation, when the case was shown to the Berlin Medical Society.

ON THE FUNCTION OF THE COCHLEA.

DR. C. CORRADI, of Verona, having performed a number of experiments, chiefly upon the cochlea of guinea-pigs, draws the following conclusions:

1. It cannot be shown with certainty, that in the human labyrinth there are other parts besides the cochlea, in which acoustic impressions can be made. In guinea-pigs, total destruction of the cochlea in both ears is followed by absolute and permanent deafness.

2. Partial destruction of the cochlea does not lead necessarily to complete and permanent deafness. It sometimes happens, therefore, that either immediately after the operation or some time after it hearing is again observed, which must be ascribed to the remaining uninjured parts. When hearing returns not until some time after the operation, the delay must be ascribed to shock, extravasation of blood, or reactive inflammatory disturbances in the remaining parts of the cochlea.

3. It is very probable that the perception of the variation in pitch of notes depends upon different parts of the cochlea; the deeper the note the nearer the cupola lies the portion of Corti's organ perceiving it.—*Archiv für Ohrenheilkunde*, vol. xxxii. pp. 1-14.

A NEW BORIC ACID PREPARATION IN THE TREATMENT OF CHRONIC PURULENT OTITIS MEDIA.

DR. MAX JANICKE, of Görlitz, recommends the use of a neutral borate or tetra-borate of soda, in the treatment of chronic purulent otitis media. This preparation is obtained by heating equal parts of boric acid, borax, and water. Upon cooling, the precipitate will be found to be neutral in reaction. It is soluble to the extent of 16 per cent. in water, at the ordinary temperature of the room, while in boiling water it is soluble to an almost unlimited extent. This salt possesses the valuable peculiarity that, unlike other salts, it does not precipitate from its hot concentrated solution immediately upon cooling. Precipitation does not occur for some time after cooling, so that solutions of 50 per cent. may be used in the drum-cavity. Thus, a large quantity of an antiseptic material can be introduced into and kept in the drum-cavity for a long time. Once in twenty-four hours is often enough to apply the solution in cases of moderate discharge, while in slight discharges less frequently will answer. The neutral borate of sodium is extremely mild and unirritating. After the use of the above-named solution in cases of large perforation in a total of the membrana tympani, some of the same neutral salt may be blown into the ear.—*Archiv für Ohrenheilkunde*, vol. xxxii. pp. 14-24.

THREE CASES OF ACUTE OTITIS MEDIA FOLLOWED BY ACUTE CARIES OF THE MASTOID PROCESS, AFTER MEASLES.

DR. M. BOLT, of Groningen, Holland, observed and reported three cases of the above-named nature during an epidemic of measles (*Archiv für Ohrenheilkunde*, vol. xxxii. pp. 25-28).

The first case was that of a girl, aged two and one-half years, who began to show prodromes of measles. Before the eruption appeared an acute purulent otitis media, with intense pain, occurred in the left ear. In the course

of a few days, mastoid tenderness and swelling set in. The swelling increased rapidly, fluctuation was felt, and the abscess opened into the external meatus. A large subperiosteal abscess being found in the mastoid, the corticalis was broken open with the chisel and removed, the mastoid cavity being found filled with granulations. The latter was scraped with a sharp spoon, so that communication was established between the antrum and the middle ear and the external auditory canal. The wound was packed with iodoform gauze. Two days after the operation the eruption of measles appeared, and the disease ran its course without interruption. In ten days the wound in the mastoid was permitted to cicatrize. A little discharge continued from the ear, due, apparently, to a small sequestrum in the auditory canal.

The second case was that of a boy, five years old, in whom, it was stated, the aural disease began during desquamation, after measles. In this case a burrowing abscess, starting from the posterior wall of the canal, was found filling the external auditory canal. In the mastoid region there was a fluctuating swelling, which spread far up on the side of the skull. No opening in the abscess could be found. An incision high up in the swelling on the side of the head, gave vent to pus. At this point the bone was denuded and carious. The swelling was composed largely of soft granulations. After the removal of these granulations, the periosteum beneath was found normal. The bone beneath it showed wide vascular foramina. The mastoid was now chiselled open in the regular way; the bone was softened, and yellow granulations protruded from the mastoid cavity. The latter was scraped free of its granulations, but the antrum was not opened. The wound was tamponaded with iodoform gauze. In four days the burrowing abscess in the external auditory canal had gone down greatly, but it was opened, then giving vent to very little pus. In twelve days the swelling in the auditory canal had gone down, and suppuration had ceased. The perforation in the membrana had been a very small one, if any had existed; there was none to be seen now. No fever occurred after the mastoid operation. In three months after the operation the patient was dismissed with hearing of five metres for whispered words.

The third case was that of a little girl, four years old, who complained of intermittent earache during the period of desquamation after measles. A month later the ear pain became so intense that the child could not sleep, until spontaneous perforation of the membrana, with copious flow of pus, occurred. This discharge gradually diminished in the course of three weeks, when a swelling behind the ear was observed, and the child complained of feeling unwell. A month later the patient was examined by Dr. Bolt, who found the right auditory canal filled with pus, and a small perforation in the centre of the membrana tympani. In the mastoid region there was œdematous swelling and fluctuation.

A large, subperiosteal abscess was now opened, giving vent to laudable pus. The corticalis was extensively softened, and it was chiselled away. The mastoid cavity was filled with soft granulations, beneath which there was a collection of pus. Upon removal of these granulations the bony wall of the lateral sinus was destroyed at the point where the collection of pus was found. The opening in the sinus-wall was 5 mm. long by 3 mm. wide. The membranous wall of the sinus appeared normal. No irrigation for fear of

infecting deeper parts. Iodoform tampon. By the first change of dressings the suppuration in the ear had ceased, and the perforation of the membrana had closed. Two months after the mastoid operation the wound had cicatrized, and the child could hear whispered words four metres.

HEMORRHAGES INTO THE LABYRINTH IN CONSEQUENCE OF ANÆMIA.

DR. J. HABERMANN, of Prague, reports (*Archiv f. Ohrenheilk.*, vol. xxxii. p. 82), two cases of hemorrhage into the labyrinth, one in consequence of pernicious anæmia, the other in consequence of simple anæmia. In the first instance, the patient was a young servant girl, twenty-one years old. Post-mortem, among other conditions, revealed hemorrhages into the meninges, brain, pharynx, pericardium, and small intestine, but none in the retina. An examination of the right auditory organ revealed neither micro- nor macroscopic changes in the middle ear. In the cochlea, however, there was a small hemorrhage in the upper end of the ligamentum spirale, in the region of the anterior periphery of the basal whorl, of the scala vestibuli, and a somewhat larger one in the basal whorl in the upper half of the canalis ganglionaris. Here the blood was between nerve-fibres and the ganglion cells. Extensive hemorrhages were found in the vestibule and in the semicircular canals; also between the ligaments of the utriculus, on the posterior wall, and on the outer wall, near the posterior edge of the stapes (oval window). Copious hemorrhage also had occurred near the mouth of the aquæductus vestibuli, and in the external semicircular canal. The extravasation of blood was supposed to be due to diapedesis. The deafness and tinnitus aurium complained of during life was referred to the hemorrhages. The vertigo could have been due to the simultaneous lesion in the brain.

The second case of labyrinth-hemorrhage, the result of simple anæmia, occurred in a young woman twenty years old. In this patient there ensued hemorrhages into the stomach, the intestines, and then the retina. Finally, there occurred hardness of hearing, tinnitus aurium, and, at times, vertigo. Treatment of the anæmia was followed by improvement in hearing.

OSSEOUS NEW-GROWTH IN THE MEMBRANA TYMPANI.

DR. HABERMANN also found an osseous new-formation in the membrana tympani, in a woman thirty years old, who had died of phthisis. The left organ of hearing being examined, it was found that the membrana tympani contained a large perforation, on the anterior edge of which there was a calcareous deposit 2-3 mm. thick and 4 mm. high. The end of the hammer-handle projected into the perforation, and the tendon of the tensor tympani was bound to the anterior tympanic wall by fibrous tissue. Microscopic investigation of the middle ear showed a thickened mucous membrane, especially at the niches where the inner passes into the lower wall. In the membrana tympani at several points were found calcareous deposits, cartilage-cells, and, at one point, *true bone-cells*, with numerous delicate offshoots into the surrounding calcified tissue. No Haversian canals and lamellæ were found.

DIAGNOSIS, PROGNOSIS, AND TREATMENT OF PROGRESSIVE DEAFNESS IN CHRONIC NON-SUPPURATIVE INFLAMMATION OF THE MIDDLE EAR.

This is the title of a paper read at the Tenth International Medical Congress by PROF. GRADENIGO, of Turin (*Archives of Otology*, vol. xx., No. 3. Translation by Dr. J. A. Spalding, of Portland, Me.). The subject is discussed, as to prognosis, under two chief heads, viz.:

1. Whether, together with the functional disturbances which are to be referred to the conducting apparatus, there may or may not be, present functional disturbances which are due to trouble in the inner ear (absence of bone-conduction for the watch, diminution of hearing for high tones, and attacks of vertigo).

2. Whether the membrana tympani is retracted or not. It can be said, on the whole, that in some forms the morbid alterations affect the membrana (hyperæmia and retraction) and the Eustachian tube, whilst in others it is the vestibular wall of the tympanic cavity (stapedial vestibular ankylosis) which has been attacked.

3. Finally, there are cases in which the inner ear has suffered.

The symptoms in the first class are, for the most part, removable, and can be improved by proper treatment, even if not entirely cured, whilst if neglected they may assume the characteristic forms of the second and third group, which are much more serious. The morbid processes in the last class have a tendency to become progressive (occasionally with great rapidity), and to lead to a degree of deafness which may in time become total. In every case the prognosis must be guarded, "because forms in the first group which improve in the first fifteen or twenty days under suitable treatment, occasionally deteriorate later, despite the continuation of the same treatment (or, perhaps, owing to the same), and pass over into those of the second or third groups."

The following is a category of the remedial plans pursued in these cases:

I. Direct treatment of the ear.

A. *From the external meatus:*

- a. Massage of the ossicles (Lucæ).
- b. Massage of the membrana tympani (Delstauche).
- c. Surgical treatment within the tympanum (plicotomy, myringotomy, myringectomy, tenotomy of the tensor tympani-mobilization of the stapes).

B. *From the tube:*

- a. Catheterization; simple air-douche.
- b. Injection of atomized remedies into the tympanum by means of the catheter (sal ammoniac, ether, chloroform, iodoform, iodine, etc.).
- c. Injections of liquid substances by means of the catheter into the tympanum (alkaline solutions, iodide of potassium, pilocarpine, cocaine, iodoform, vaseline).
- d. Methodic introduction of celluloid bougies and massage of the tubes.

II. Local treatment of the nose (irrigation, pencilling, galvano- and thermo-cauterizations).

III. General treatment, such as iodide of potassium, arsenic, atropine, eserine, ergotine, and quinine.

IV. Electric treatment (galvanic current and interrupted current).

Excepting the surgical treatment within the tympanum, and the naso-pharyngeal treatment, it must be confessed that all of the remedies which he has catalogued the author thinks are but little more than temporarily useful. Injections into the tympanum irritate and congest the mucous membrane of the entire membrana, as can be easily seen by inspection. Constitutional treatment by such drugs as ergotine, atropine, etc., has been abandoned entirely by the author.

Basing his views upon investigations conducted by himself and Professor Maggiora, the author furthermore concludes "that at least atrophic and sclerotic forms of catarrhal inflammation of the middle ear are quite independent of the influence of pathogenic microorganisms. These conclusions have been strengthened by the fact that an antiseptic treatment of the disease in question was useless in the experience of Gradenigo. The views of the latter as to the best manner of treatment of chronic catarrh of the middle ear may be summed up as follows: "Since chronic catarrhal affections of the middle ear, in general, are connected with peculiar pathological alterations in the mucous membrane of the naso-pharynx, we ought, instead of resorting to antiseptic measures, to try such as may influence the vitality of the tissues affected."

But all cases must be carefully studied for themselves and their peculiarities. Patients who are not benefited by long-continued direct treatment of the external ear and injections into the tympanum, obtain relief from careful treatment of the naso-pharyngeal mucous membrane.

INJURIOUS EFFECTS OF THE TELEPHONE UPON HEARING.

GELLÉ, of Paris, observes that those who frequently use the telephone sometimes present a series of aural disturbances similar to those resulting from the continued action of loud noises. In such cases there may be found inflammation of the membrana tympani and of the tympanic cavity, or there may be irritable conditions of the nervous apparatus of the ear, exercising an influence upon the general nervous system. Hence, in the cases observed, there were pains in the ear, diminished hearing, subjective noises, hyperæsthesia acoustica, and vertigo, all of which were manifested at first during loud auditory impressions, but later became permanent, with general nervous irritability. Probably, for the production of the aforesaid disturbances, there must be a certain predisposition, due either to a greater excitability of the entire nervous system or a previous and still existing disease of the auditory organ.—*Annales des Maladies de l'Oreille*, No. 12.

OBSTETRICS.

 UNDER THE CHARGE OF

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A SUCCESSFUL CÆSAREAN SECTION.

T. GAILLARD THOMAS reports a successful Cæsarean section (*Medical Record*, 1892, vol. xli., No. 20, p. 534), performed upon a dwarf at ten months of gestation. The true conjugate was two and five-sixths inches; the spine was straight, and the long bones well formed. The patient was a primipara, and the operation was done when dilatation was partly complete. Under thorough antiseptis, a long incision was made, and three silk sutures passed at the upper extremity of the incision, and left untied. The uterus was lifted out of the abdomen, and wrapped in a moist antiseptic towel in the hands of an assistant. A large flat sponge was placed over the intestines, and the abdominal walls closed over it by the three sutures. An elastic tubing was placed round the cervix, and a single knot made in it without constriction. A small sponge was put in the lower angle of the wound, and the point of exit of the uterus from the abdomen was protected by moist antiseptic towels and gauze. The uterus was opened by a bistoury, and then by scissors. The child was delivered, the cord secured by clamps, and severed, and the placenta detached without effort, and completely. Slight hemorrhage was stopped by the cervical ligature. The uterus was cleansed with a sponge, and the cavity dusted with iodoform. The uterus was closed with deep sutures of silk, three to an inch, extending down to the mucosa, and with intervening, superficial, silk sutures, one to every interspace. After the uterus had been returned to the abdomen, the peritoneal cavity was sponged out, the omentum drawn down over the uterus, and fluid extract of ergot injected into the patient's thigh. The abdominal wound was closed with silkworm-gut, an ordinary antiseptic dressing applied, no food or drink allowed, but morphine hypodermatically was administered three times during the night. The child was a male, weighing ten pounds fifteen ounces; the occipito-frontal diameter of its head measured five inches.

Thomas prefers chloroform to ether, for Cæsarean section; he would operate during the first stage of labor; he frankly admits that he should not feel warranted in performing laparo-elytrotomy in view of the present success of Cæsarean section.

 UTERINE MOLE COMPLICATED BY HEMORRHAGE, TERMINATING IN
RECOVERY.

WARMAN (*Centralblatt für Gynäkologie*, 1892, No. 19) reports the case of a multipara suffering from severe hemorrhage and collapse. The prompt use

of stimulants resulted in reaction; the uterus was as large as at five months. Evidences of the existence of a fœtus were wanting. Examination revealed a mass in the uterus resembling a placenta in placenta prævia. A watery fluid, with abundant mucus, came from the uterus after examination. Uterine contractions were strong. As the mother's condition did not warrant radical interference, an iodoform-gauze tampon was applied, and eight hours afterward a large uterine mole was expelled. Neither fœtus nor placenta could be found in the mass. The tumor and its fluid occupied a measure holding four and a half quarts.

THE TREATMENT OF UTERINE MOLE.

FRITSCH (*Ibid.*), in remarking upon the above case, describes his treatment in his own practice, and considers active interference strongly indicated. He employs the curette as soon as possible, as the safest and most efficient means of checking the hemorrhage and terminating the case.

DEATH FROM RETROFLEXED AND INCARCERATED UTERUS.

TREUB (*Nederl. tijdschr. v. Verlosk en Gynäkol.*, Jahrg. iii., No. 3) reports a fatal case of incarcerated, pregnant uterus. The post-mortem revealed gangrene of the colon, followed by acute peritonitis. He has collected fifty cases of death from this cause, and in none of them, except his own, was gangrene of the intestine a cause; 13 perished of uræmia, 11 of rupture of the bladder, 6 of sepsis, 10 of peritonitis following cystitis, 3 of pyæmia, 2 of rupture of the peritoneum, and 5 of accidents accompanying an effort to replace the uterus. Gangrene of the intestine is, therefore, an unusual cause of death in this condition.

A TUBAL ABORTION.

An interesting case of tubal abortion is reported by RENTELN at the Evangelic Hospital, St. Petersburg (*St. Petersburger medicinische Wochenschrift*, 1892, No. 16). The patient was a primipara, pregnant between three and four weeks. Her symptoms were those of abdominal pain, giddiness, and flooding. These increased in severity in spite of rest and opium. The patient's condition finally necessitated active stimulation, and four days after she was taken ill, examination revealed a tumor at the left side of the uterus as large as a hen's egg. There were also some thickening and indistinct fluctuation on the left side. A diagnosis was made of tubal abortion from the left tube. The patient was brought into a hospital, placed in Trendelenburg's posture, and anæsthetized with chloroform. Abdominal section confirmed the diagnosis. The sac was found above the left ovary, and a pedicle of considerable length could be made from a fold of the broad ligament. The sac was accordingly removed, and the ovary left. Blood and clots were sponged out of the abdomen, and it was closed without drainage. Examination of the specimen revealed the sac of a tubal pregnancy as large as a hen's egg; ligated and removed. The ovum was as large as a walnut, and the beginning

of a placenta and the embryo could be distinctly made out. (A recent case operated upon by the writer was a tubal abortion which had occurred four weeks before the operation. The physician in attendance supposed the abortion to have been intra-uterine; a large sac was found full of blood-serum and clot, with the débris of an embryo of a few weeks' development. The patient was a healthy woman, and survived the abortion after spending two weeks in bed. The cavity in this instance was cleansed by an aseptic sponge, and packed with iodoform gauze. Its gradual obliteration, and the recovery of the patient, followed.)

PUERPERAL TETANUS.

In the *Archives de Tocologie*, 1892, No. 3, VINAY reports the case of a multipara, aged thirty-six years, who suffered from abortion during the second month of her fourth pregnancy. She had hemorrhage for several days, and did not know the exact time of the abortion. No interference was practised at the time; the lochia shortly afterward became foul, and the uterus was curetted under chloroform anæsthesia. Portions of retained membrane, decomposed, were removed, and an hour afterward the patient had a violent chill. The second day after the curetting she suffered from pain in the masseter muscles; trismus and spasm of the pharynx with difficult deglutition soon followed. The general symptoms of tetanus rapidly supervened. The pulse was 108, the temperature $98\frac{5}{10}^{\circ}$. Thirty-six hours after the appearance of the first symptoms the patient died. No autopsy was obtainable. Vinay has collected 106 cases; 47 of these occurred after abortion, 59 after parturition at term. The first three months of pregnancy is the most susceptible period, and the patient during the first half of pregnancy is in much greater danger of tetanus than subsequently. Tetanus most frequently follows some minor manipulation, and hence comparatively few of the cases occur in maternity hospitals, as most of them are treated at their homes. Artificial delivery occurred in most instrumental cases, and next in frequency was the use of the tampon; the forceps and version do not predispose to tetanus, while Vinay could find but one case of craniotomy so complicated, and but one case of Cæsarean section. Multiparas above the average age are most often attacked. The most important influence in predisposing to tetanus is the wretched surroundings of patients who suffer from it, and especially living in damp and squalid lodgings. There seems reason to believe that trismus may be conveyed by contagion, as in a case reported by Henricius. Amon also reports a case of artificial delivery of a placenta, where he seemed to convey the poison of tetanus from the wounded hand of the husband, which he had dressed, to the mother's uterus. Tetanus is also most frequent in the tropics, where the condition of the soil seems favorable for the development of telluric bacteria.

Puerperal tetanus usually develops during the first week after labor, and becomes acute or chronic. The prognosis is doubtful, and usually hopeless. Out of 106 cases, 94 proved fatal, a mortality of $88\frac{57}{100}$ per cent. The mortality of abortion complicated by tetanus is 1 per cent. greater than that of labor at term under similar circumstances. The diagnosis may be doubtful in cases of severe hysteria; in prophylaxis, the employment of antiseptics

and the precaution that a physician attending a tetanus patient should not attend confinement cases, will be sufficient. The treatment consists in antisepticizing thoroughly the genital tract, and in the employment of sedatives. Prophylactic inoculations with cultures of the bacillus of tetanus have not yet been extensively employed.

GYNECOLOGY.

UNDER THE CHARGE OF

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PNEUMOCOCCI IN THE PUS FROM A PYOSALPINX.

FROMMEL (*Centralblatt für Gynäkologie*, 1892, No. 11) reports the following case: The patient, aged thirty-eight years, had a tuberculous disease of the left apex at the age of twenty-three, and later Pott's disease. She had aborted seven times. Laparotomy was performed for pyosalpinx on the right side; during the operation pus escaped into the cavity and the patient died of septic peritonitis on the third day. At the autopsy no old changes were found in the lungs. Bacteriological examination of the pus from the tube revealed the presence of microorganisms exactly resembling Fränkel's pneumococci, which retained their virulent properties in pure cultures, animals inoculated with them rapidly succumbing. Fränkel himself confirmed the diagnosis.

Aside from the interest attaching to the unusual presence of these cocci in a pyosalpinx, is their extreme virulence toward the peritoneum, although none were found in the cavity after death. Since the autopsy was not performed for forty-eight hours, it is quite probable that they were originally present and were destroyed post-mortem. How they entered the tube it is impossible to say. Neither in this case, nor in a similar one reported by Zweifel, was any pneumonic process found in the lungs. They must have been in the air and found access to the genital tract through the vagina in the same manner as other ubiquitous organisms.

STRANGULATED HERNIA OF THE OVARY.

MAYLARD (*British Med. Journal*, April 9, 1892) reports the following interesting case: A maiden lady, aged seventy-five years, had been troubled with a swelling in the left groin for three years, of unknown origin. The only symptoms to which it gave rise were urinary, but these were entirely relieved on assuming the dorsal posture, when the tumor disappeared. On one occasion it came down and could not be reduced as usual. It became tense, the skin over it was reddened, and there was considerable local pain.

When examined by the reporter, five days later, it was quite tender; but, although situated at the usual site of a femoral hernia, no impulse was obtained on coughing, the bowels were open, and there was no vomiting or general disturbance. The attending physician had made the diagnosis of strangulated hernia of the ovary. A week later the tumor was larger and there was a slight rise of temperature, but no serious symptoms had appeared. An incision was made as for femoral hernia and the tumor was peeled out of a sac to which it was adherent. The patient made a good recovery. A microscopical examination of the growth showed that it was an enlarged ovary containing a large blood-clot.

The writer states that from a careful review of the literature of the subject he finds his case to be unique, as regards not only the age of the patient, but the location of the hernia. Nearly all the recorded cases have been those of inguinal strangulation, usually associated with bowel or omentum. The only symptom in the case cited—reflex vesical irritation—has not been previously noted.

AN UNUSUAL FORM OF SECONDARY CARCINOMA OF THE UTERINE BODY.

BENCKISER (*Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxii., Heft 2) found, in a uterus removed *per vaginam* for cancer of the cervix, that the disease had extended above the os internum, the corporeal endometrium being traversed by deep furrows between which were opaque reddish nodules. On microscopical examination the epithelium was seen to be normal in the furrows, while over the nodules the epithelial cells were enlarged and contained large transparent nuclei, while the mucosa was infiltrated with round cells. A few glands still retained their epithelial lining. A small fibrous polypus at the fundus had undergone cancerous degeneration. It was evident that the secondary disease in the corpus uteri had affected only the superficial epithelium, the glands and connective tissue being healthy. The patient being fifty-nine years of age, the absence of glands might be explained as due to climacteric changes. The patient was free from recurrence two years after operation.

THE CAUSES OF RECURRENCE AFTER THE REMOVAL OF CANCER.

WINTER (*Centralblatt für Gynäkologie*, 1892, No. 11) states as the result of extended observations that if cancer is limited to the uterus, so far as can be ascertained at the time of operation, it is seldom that the lymph-glands are already affected. Metastasis in the viscera are rare, since he noted only 7 cases out of 123. Local recurrence is most common. Of 230 women whose uteri had been removed for cancer, this was observed in 50 per cent. After total extirpation for commencing epithelioma of the cervix, extensive infiltration of the perimetrial tissues appears due, not to the growth of diseased nodules which have been left behind originally, but to infection of healthy tissues during the operation. The following arguments are advanced in favor of this theory: 1. Cancer of the cervix, if not touched, is accompanied by only moderate thickening of the parametria, especially posteriorly, while after operation the induration becomes more marked and

general. 2. Recurrence from non-removal of all the diseased tissue occurs in the cicatrix and extends outward, while recurrence from infection during operation may result in extensive pelvic induration while the cicatrix remains unaffected. 3. The latter occur so quickly and universally that they cannot be attributed to the growth of isolated foci. 4. They are observed only in those cases in which cancerous matter has been allowed to come in contact with a healthy wounded surface. 5. Those forms of cancer which develop in the cervical or corporeal mucous membrane allow a better prognosis than does extensive disease of the portio, because in the former case infection can be prevented by care during the operation, the uterine cavity being previously disinfected and the os sutured; in the latter, the use of the sharp spoon, followed by the Paquelin cautery, will do much to lessen the danger.

THE ASSOCIATION OF CARCINOMA UTERI WITH FIBRO-MYOMA.

SCHRAMM (*Centralblatt für Gynäkologie*, 1892, No. 12) is somewhat sceptical regarding the alleged frequency with which carcinoma and fibro-myoma occur in the same specimen, since he has been able to find only nine authentic cases in the literature of the last five years. He denies that a uterine fibroma ever undergoes cancerous degeneration. The development of a cancerous nodule in the corpus uteri in the vicinity of the benign growth may be regarded as the result of chronic congestion and endometritis induced by the latter; between cancer of the cervix and myoma there can be no causal relation, their simultaneous occurrence being purely accidental.

[The writer's search through the literature must have been confined to papers in his own language. We have examined three or four specimens of carcinoma and fibro-myoma associated in the same specimen, presented at the New York Obstetrical Society during the past three years.—H. C. C.]

A RARE FORM OF FIBRO-CYST OF THE UTERUS.

MATLAKOWSKY and PRZEWOSKI (*Gazeta Lekarska; Centralblatt für Gynäkologie*, 1892, No. 12) describe the minute anatomy of an interesting fibro-cystic tumor, which they regard as a unique specimen of *cavernous lymph-angioma*. The patient, aged thirty-four, had suffered for several years from dysuria and temporary enlargement of the abdomen after every menstrual period. From eight to ten days after the cessation of the period she would have a gush of clear fluid from the vagina, with a simultaneous decrease in the size of the tumor, so that it could hardly be felt above the pubes. These facts were positively established by repeated examinations. Supra-vaginal amputation was performed successfully, and the tumor was carefully examined. It had originated through primary enlargement of the lymphatics within the normal uterine tissue, followed by disappearance of the muscular substance and expansion of the connective tissue. The interior of the mass consisted of a network of fibres, the interstices of which were filled with serous fluid, that had escaped into the uterine cavity every month by an actual rupture of the enclosing wall, the opening subsequently closing. Unlike the condition in ordinary fibro-cysts, the ectasia of the

lymphatics was primary and did not occur in a preëxisting fibro-myoma, as described by Leopold and others.

PREGNANCY AND VENTRO-FIXATION.

FRAIPONT (*Annal. de la Soc. Méd.-chir. de Liège*, 1892, No. 4) reports seven cases of ventro-fixation by Winiwarter and himself, three of the patients, who were married, becoming pregnant soon after operation, although one of these had a small ovarian cyst and two a cystic ovary. In each instance the diseased ovary was removed and the fundus uteri was attached by deep sutures including the edges of the abdominal wound. One woman was delivered at term, another at seven and one-half months, in consequence of an accident, the child living; the third bore a living child at the eighth month. All the patients complained of severe pains in the cicatrix between the third and fourth months of pregnancy, which were absent in the latter half. Labor was normal in each instance. In one case only the uterus was found to be retroverted after delivery. It is doubtless desirable that pregnancy should not occur so soon after the operation, since the adhesion is at first quite firm, but later becomes more cord-like and distensible, allowing the uterus to rise out of the pelvis, while preserving its normal position.

THE PALLIATIVE TREATMENT OF CARCINOMA UTERI WITH ALCOHOL.

SCHULTZ (*Centralblatt für Gynäkologie*, 1892, No. 13) reports ten cases of cancer of the cervix uteri treated by injections of alcohol. He uses absolute alcohol, injecting from one to two cubic centimetres at one sitting. In one case forty-eight injections were made at intervals of a day or two. There is little pain, provided that the needle is plunged deeply into the diseased tissue. Most of the alcohol escapes after withdrawing the needle, bringing away with it broken-down tissue. In the cases reported the treatment resulted in diminution of the diseased area, with the gradual formation of healthy epithelium over it. Hemorrhage and foul discharge ceased and there was a notable improvement in the patient's general health.

THE INFLUENCE OF PELVIC DISEASES ON THE VOICE.

KLEIN (*Journ. Am. Med. Assoc.*, 1892, No. 16) says that during menstruation women are prone to inflammation of the tonsils and larynx, and that he has observed in singers at this time that the voice often becomes hoarse and deep, assuming a masculine tone, so that one who is accustomed to noting the difference can tell when they are menstruating.

In many cases of ovarian disease he has observed hypertrophy of the tonsils and uvula; as in eunuchs, there appears to be an intimate relation between the voice and the sexual organs.

THE INFLUENCE OF PERITONITIC ADHESIONS ON PARTURITION.

HOLOWKO (*Zeitschrift für Geb. u. Gynäkologie*, Band. xxi., Heft 2) reports an interesting case which he believes illustrates a possible danger attending labor after ventro-fixation of the uterus. A woman in the eighth month of

pregnancy on making a sudden movement was seized with a severe pain in the abdomen, which became rapidly worse and was attended with symptoms of general peritonitis. She was delivered spontaneously, but died an hour after. At the autopsy a quantity of blood was discovered in the peritoneal cavity, which had escaped from the rupture of adhesions between the ascending and transverse colon. There were no evidences of sepsis.

CHANCRE OF THE CERVIX UTERI MISTAKEN FOR EPITHELIOMA.

PICHEVIN in a clinical lecture (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1892, No. 2) showed an interesting case, in which an ulceration of the cervix uteri had been diagnosed as commencing epithelioma and cauterized. The marked induration of the cervix and the general decline of the patient's strength seemed to confirm the diagnosis, and hysterectomy was advised. On being admitted to the hospital she was examined by Pichevin, who found an irregular superficial ulceration of the posterior lip, with everted edges and a hard base. The anterior lip was of normal appearance and consistence. Although the diagnosis of epithelioma was regarded as highly probable, it was thought advisable to keep the patient under observation, and to excise a bit of tissue for microscopical examination before performing a radical operation. A few days later she developed a characteristic syphilitic roseola. The true condition had been masked by the cauterization.

[This instructive case seems to present an argument against the premature resort to total extirpation at a stage when there is still a reasonable doubt as to the presence of malignant disease. A less cautious surgeon might have operated successfully and reported the case as a permanent cure—a source of error which we ought to bear in mind in considering the statistics of the operation.—H. C. C.]

VAGINAL HYSTERECTOMY FOR CARCINOMA.

At a recent discussion of this subject at the Surgical Society of Paris (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1892, No. 2), BORILLY reported fifty cases of total vaginal extirpation, with a mortality of 32 per cent. Six patients had remained well, one for four years; in all the others there had been a recurrence within from two to twelve months after the operation. In fifteen cases of amputation of the cervix an early recurrence was noted in every instance.

RICHELOT stated that he had followed the suggestion of Verneuil to institute a comparison between the results of high amputation and total extirpation, by performing the operations upon two series of cases under similar conditions; he had found that recurrence occurred much earlier after the partial operation. He emphasized the fact that when the disease was apparently limited to the cervix, secondary nodules were found in the corpus uteri, and reported illustrative cases.

MARCHAND affirmed that hyperplastic endometritis was a common accompaniment of cancer of the cervix, and might be mistaken for malignant disease of the corporeal endometrium.

ENDOTHELIOMA OF THE OVARY.

ROSTHORN (*Archiv für Gynäkologie*, Band xli., Heft 3) describes and figures the appearances observed in microscopical sections of so-called endothelioma, which he regards as a true neoplasm, favoring the term "sarcoma perivasculaire" applied to it by Ackermann. He thinks that capillary stasis is doubtless an etiological factor in its development. Several forms of endothelioma may be distinguished according to their mode of origin and the prevailing histological structure.

[It is hardly necessary to call the attention of the reader to the original work of American observers—Jones, Boldt, and more recently Foerster. All agree regarding the histological peculiarities of this interesting condition, and its close resemblance, anatomically at least, to a malignant neoplasm. Unfortunately, its true importance from a clinical standpoint has not yet been definitely settled. It is highly desirable to know, not only if it is possible to recognize at the examining-table an ovary which is the seat of endothelioma, but also if it gives rise to symptoms different from those of ordinary chronic oöphoritis, which form a more urgent indication for prompt removal by laparotomy.—H. C. C.]

LIPOMA AND FIBROMA OF THE FALLOPIAN TUBE.

PARONA (*Ann. di Ostet. e Gin.*, 1892, No. 2) in removing the adnexa for the cure of uterine fibro-myoma, encountered a lipoma the size of a pear, from which was pendent a normal ovary. The tube was so imbedded in the tumor that only the fimbriated end was visible. It apparently developed from one of the fimbriæ.

SPAETH (*Zeitschrift für Geb. u. Gyn.*, Bd. xxii., Heft 2) reports the case of a patient from whom he removed a tube which contained a true interstitial fibro-myoma imbedded in its wall at a short distance from the uterine end. There were no evidences of chronic inflammation in the tube, so that it could not have been a case of so-called pachysalpingitis.

ENDOMETRITIS IN ACUTE GENERAL DISEASES.

MASSIN (*Archiv für Gynäkologie*, Bd. xl., Heft 1) examined twelve uteri from fatal cases of typhoid fever, pneumonia, etc., and found acute interstitial inflammation of the muscular wall, as well as of the endometrium, with superficial hemorrhages, the latter being most extensive in connection with continued fever. They were apparently due to venous stasis. The glands showed cloudy swelling and granular degeneration of the epithelium, with hemorrhages into the lumen.

ASSOCIATED STREPTOCOCCUS INFECTION OF THE VERMIFORM APPENDIX AND FALLOPIAN TUBE.

ROBB (*Bull. Johns Hopkins Hospital*, 1892, No. 20) reports at length a fatal case of this character, calling attention to the following points: The vermiform appendix was adherent to the right ovary and tube, and both in the tube and in the appendix were found streptococci pyogenes. Death was imme-

diately due to hemorrhage from a recent duodenal ulcer (due to cauterization of the stump of the appendix?). As the cocci were not found in the left tube, there seemed to be good reasons for inferring that the infection extended directly from the intestine to the tube.

The writer concludes that in the presence of such virulent organisms drainage is practically useless.

PÆDIATRICS.

UNDER THE CHARGE OF

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A CASE OF RETRO-PHARYNGEAL LYMPHADENITIS REQUIRING TRACHEOTOMY.

BOKAI (*Jahrbuch für Kinderheilkunde*, 1892, Band xxxiii., Heft 3, p. 360) reports a case of retro-pharyngeal lymphadenitis in a child eight months old, in which tracheotomy was necessitated by the supervention of alarming symptoms of suffocation. The posterior wall of the pharynx showed diffuse, hard swelling without fluctuation, and a deep incision into the mass had yielded no pus. After the tracheotomy the threatening symptoms were relieved and resolution was quickly established, the tube being removed at the end of three days. The case is interesting in view of the gravity of the symptoms caused by a simple adenitis, and also for the success achieved by tracheotomy. Contrary to the statements of some writers, Bokai finds that in both lymphadenitis and retro-pharyngeal abscess tracheotomy is rarely indicated. In an experience of 400 cases of abscess observed in the Pester Kinderspital, tracheotomy was not required in a single instance; and among 112 cases of simple retro-pharyngeal lymphadenitis, not one presented such grave symptoms as did this case. The success of tracheotomy in a child only eight months old also shows that this operation, under appropriate conditions, is not contra-indicated by an age under one year.

MAMMARY ABSCESS IN THE NEWBORN INFANT.

COMBY (*La France Médicale*, 1892, No. 9, p. 138) records three cases of suppuration of the mammary gland in newborn infants. One of these was quite grave, for a small abscess opened by a careless midwife was followed by a lymphangitis and an adeno-phlegmon of the axilla. Such abscesses, he believes, are usually the result of unskilful or inopportune treatment of the

gland during the period of physiological engorgement, which occurs to some degree in most infants during the first few days after birth. Squeezing or sucking, which is the usual practice among ignorant nurses, frequently infects the excretory canals or the gland itself, thus giving rise to suppurations that may destroy all future usefulness of the organ. The treatment should consist simply of an aseptic protection of the gland with absorbent cotton or the plaster of Vigo.

THE "OSTEO-ARTHROPATHIE PNEUMIQUE" OF MARIE.

It has been so short a time since Marie called attention to the group of symptoms to which he gave the name osteo-arthritis pneumique, that as yet little light has been shed upon the obscure etiology and pathology of the disease, if indeed it can be considered other than a variety of acromegalia, as Arnold believes it to be. Lefebvre, in his exhaustive thesis on this subject which appeared last year, collected twenty-five cases reported to date. From the fact that almost, if not quite, all these cases occurred among adults, he draws the conclusion that adult life seems to be a necessary condition to the development of the disorder; and states, in addition, that his researches in the children's hospitals, despite the frequency of purulent pleurisy in childhood, were without result. Later observations, however, tend to show that children are not exempt from this peculiar affection. Moussous has reported (*Journal de Médecine de Bordeaux*, Oct., 1890, Nos. 10 and 11) a case occurring in a girl of fourteen years, following a purulent pleurisy; and Bailly, in 1862, recorded changes in the fingers and toes of a child ten years old, as a sequel of pleurisy.

The most recent contribution to the subject is found in an interesting paper by GILLET (*Annales de la Policlinique de Paris*, 1892, No. 3, p. 93), who reports two cases occurring in children.

In the first patient, a boy of twelve and three-quarter years, marked changes had existed since the age of six years, attending a condition of emphysema and bronchial dilatation, beginning at the age of four years. There were well-marked lesions of the fingers, toes, and malleoli, with decided dwarfing of bodily growth, slight flattening of the superior frontal regions, slenderness of the shafts of the long bones, and bad teeth. Growth seemed to have stopped at six years of age, and, while the boy was as intelligent as his schoolmates, he had the height and frame of a boy of six years.

The second observation concerned a girl of seven years, suffering from pulmonary tuberculosis and empyema, who showed increased size of the distal phalanges of the fingers and great toes, with the characteristic curving of the nails. After the cure of the empyema the deformations almost entirely disappeared, though the tubercular disease of the lung continued its course. It is noteworthy that this regression occurred also in the very similar case reported by Moussous; both of them occurring with an empyema. It is, therefore, evident that osteo-arthritis hypertrophiante pneumique may occur in childhood; that the lesions do not seem to invade so many bones as in adult cases; that these deformations may be recovered from; and that the same cause may produce coincidentally an arrest of development and also

trophic disturbances, either directly, or indirectly by an injurious action upon the entire organism.

THE SYSTOLIC BRUIT OF THE FONTANELLE.

In an inaugural thesis (*Ueber die Pulsation und das systolische Geräusch der Fontanelle*, Halle, December 8, 1891) ERNST WINCKLER presents a comprehensive study of the so-called systolic brain murmur, first remarked by Fisher, of Boston, in 1833. An examination of more than six hundred children has furnished fifty cases which presented this symptom. This bruit is blowing in character, is always synchronous with the cardiac systole, and is quite markedly intermittent just before its disappearance. Its seat of maximum intensity is at the fontanelle, but it may sometimes be perceived in all the regions of the cranium. No connection exists between its intensity and the size of the fontanelle, but there are variations of intensity in the same subject without appreciable reason. When he was able to auscultate the carotid, the author has detected a bruit—a fact which tends to confirm the carotid origin of the murmur, as is held by Roger, Steffen, and Epstein, of Prague.

Eighteen of the fifty observations were in perfectly healthy children, while the remaining cases were found in children suffering from rhachitis, pseudo-leukæmia, diphtheria, furunculosis, and various acute inflammations of the respiratory or gastro-intestinal mucous membranes. It is, therefore, evident that no pathognomonic importance can be attached to this phenomenon. As to its pathogeny, the author thinks that a venous origin cannot be accepted; nor can the theory of compression of the artery, in the carotid canal (Jurasz), or by enlarged cervical glands (Epstein), be held for all cases. He believes that this murmur is due to sudden changes in arterial tension, such as occur in aortic insufficiency; basing this opinion upon the character of a number of sphygmographic tracings, which he obtained from his patients, and in which he has found a resemblance to the characteristic tracings of the Corrigan pulse.

In addition to this, the administration of digitalis to some healthy children presenting the murmur caused a disappearance of the sound by regulating and raising the tension; and, again, the lowering of tension produced by fever provoked the appearance of a bruit previously absent.

These observations indicate that the systolic brain murmur is spontaneously produced in the great arteries of the base, being dependent upon conditions in the child favorable to the production of arterial murmurs, and upon the coincidence of a fall in tension and arterial pressure with an energetic cardiac action. It is, therefore, evident that this murmur will be encountered in diverse diseases, whenever the determining conditions present themselves. With healthy children it should not be considered absolutely normal, but as slightly pathological, and requiring some watchful attention. The time at which this murmur can be heard (three to five months to three to five years) corresponds to the time when the arteries are not very resisting, are proportionally larger than in later life, and very poor in elastic fibre. These conditions favor the production of the phenomenon. It is

probably for this reason, as Epstein has observed, that the bruit of the fontanelle is so often observed in rachitis.

THE ETIOLOGY OF APHTHOUS STOMATITIS.

OLLIVIER (*Revue Mensuelle des Maladies de l'Enfance*, 1892, No. 1, p. 11) adduces some new observations in support of the view that the milk of cows and goats suffering from aphthous fever is capable of producing an aphthous stomatitis in persons who drink it. He does not deny that aphthæ may result from a simple herpetic eruption or from a local irritation; but he insists that distinct manifestations follow the drinking of infected milk. This view was originally suggested in 1765, by Sagar, who observed an epidemic of the disease among the monks of a Franciscan convent, where the principal article of diet was milk derived from a herd of cows at the time affected with aphthous fever. The observations of other writers, which tend to further corroborate this view of the etiology of the disease, are discussed in detail. Bacteriological studies by Fränkel have shown the presence of the staphylococcus pyogenes citreus of Passet and the staphylococcus of Rosenbach; but neither of these organisms has a specific importance. In man, and especially in the case of children, the disease is not absolutely without danger. Demme has reported one fatal case, and Fränkel records three or four. Prophylactic measures are, therefore, important; and when several cases occur among a number of children fed upon milk from a common source of supply, the milk should be well boiled; or, better, perhaps, a new dairy should be sought.

TWO CASES OF ACUTE NEPHRITIS FOLLOWING ECZEMA.

DECIO FELICI (*Arch. Ital. di Pediatria*, March, 1892) records the cases of a brother and sister, the former six and the latter twelve years of age, who for some time had been affected with an impetiginous eczema of the face. The parents had attached no importance to the eruptions, and had sought no medical aid. The author was called in to see the children because of the supervention of œdema of the face and extremities, dyspnœa, bronchitis, and oliguria. Albumin and tube-casts were found in the urine of both children. The girl was very ill and died in coma following convulsions. The boy happily recovered. The author believes that the eczematous patches had served as a port of entry for some pathogenic germs which had been carried finally to the kidneys and there set up acute inflammation. The surface covered by the eruption was too limited to warrant the theory of reflex irritation or suppression of the functional activity of the skin.

THE SO-CALLED FEVER OF GROWTH.

BARBILLION (*Revue Mensuelle des Maladies de l'Enfance*, January, 1892, p. 1) draws the following conclusions, among others, in regard to the so-called fever of growth: 1. The fever of growth does not exist as a morbid entity. 2. Growth cannot determine fever any more than can pregnancy, the establishment of puberty, or senile involution. 3. The phenomena which have been grouped under the head of "growing fever" are due to various causes;

some are febrile states more or less clearly characterized (ephemeral fever, the fever of fatigue, gastric derangements, mild acute articular rheumatism, mild attacks of typhoid fever, intermittent fever, etc.); others are attenuated forms of acute osteomyelitis. 4. Epiphyseal pains may be observed in young subjects in any febrile condition. 5. Notable growth of the body may show itself as a sequel of any disease of childhood or adolescence, whether acute or chronic. 6. It is therefore impossible to establish a group of symptoms not constituted by the artificial association of dissimilar cases.

MICROÖRGANISMS IN THE HEALING UMBILICAL CORD.

CHOLMOGOROFF (*Zeitschrift f. Geburtshülfe u. Gynäk.*, B. xvi. H. 1) gives the results of bacteriological examinations undertaken to test the most efficient and antiseptic dressing for the umbilical cord. In all cases, cultures from the freshly cut cord, immediately after birth, showed the absence of microorganisms. The next series of observations was made upon cords dressed simply with absorbent cotton. The ligature-thread was sterilized with bichloride (1 per cent.) solution, and, after the whole body and cord were washed with soap and water, the navel was dressed with water and absorbent cotton, the dressing being changed three or four times daily. In all of seventy cases there was found the staphylococcus albus in great numbers, the staphylococcus aureus less numerously, and still less so the staphylococcus citreus; while in several instances a few colonies of the staphylococcus pyogenes, besides the sarcina lutea and the bacillus subtilis, were observed. Essentially the same results were obtained from cultures of cords dressed with lanolin. In a third series of cases, dressed with gypsum, in some the navel being washed once daily with soap and water, in others lime-water being employed as a lotion, it was found that while the development of the non-pathogenic organisms was not interrupted, the growth of the pathogenic microbes was very markedly prevented. Under the gypsum dressing the mummification of the cord took place much more rapidly than under any other dressing.

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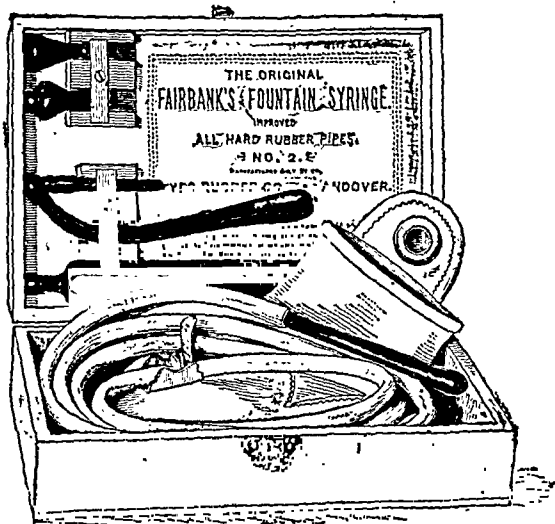
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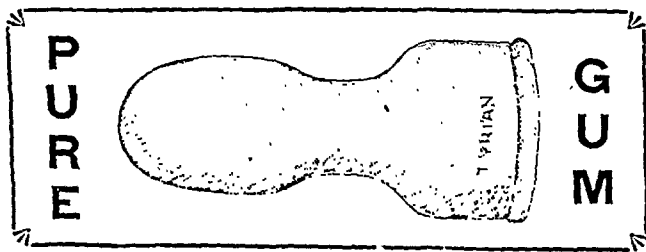
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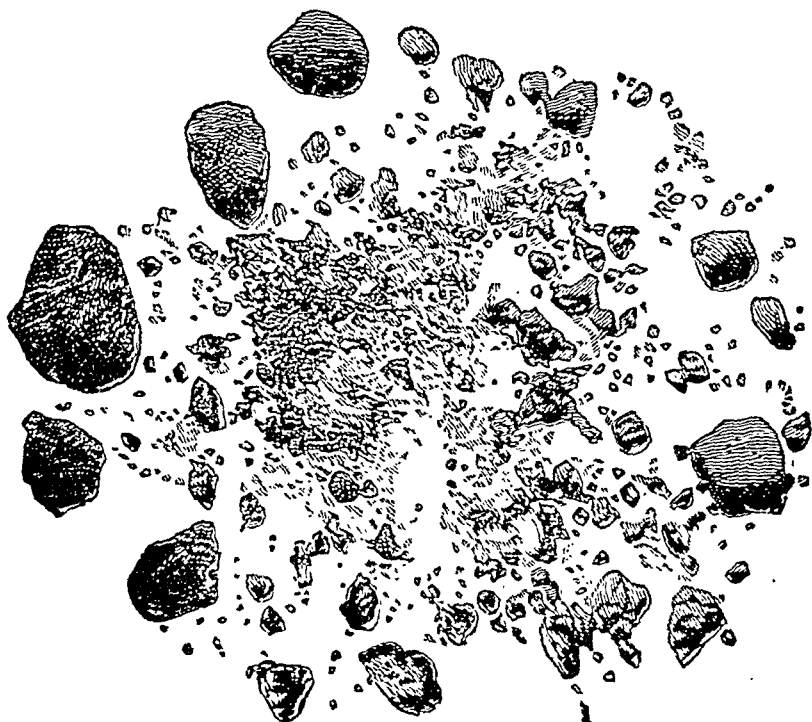
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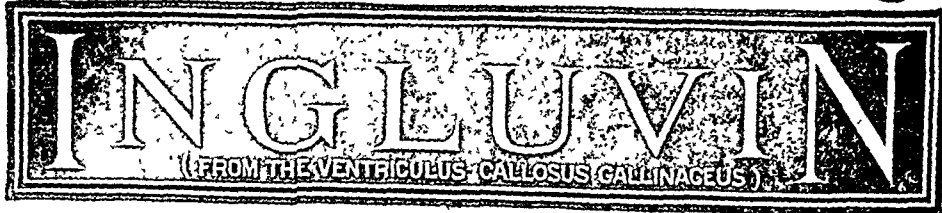
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
A Contribution to the Study of Hepatic Abscess. By WILLIAM C. DABNEY, M.D.	125
Serous Cysts in the Cerebellum. By R. T. WILLIAMSON, M.D. (Lond.), M.R.C.P.	151
The Treatment of Acute Dysentery by Antiseptic Rectal and Colon Irrigation. By W. W. JOHNSTON, M.D.	157
A Bacteriological Study of Drinking-water. By VICTOR C. VAUGHAN, Ph.D., M.D.	167

REVIEWS.

Report on Cholera in Europe and India. By Edward O. Shakespeare, A.M., M.D., Ph.D.	199
Clinical Lectures on Diseases of the Nervous System. By Professor Charcot, Paris	202
Diseases of the Eye. A Handbook of Ophthalmic Practice for Students and Prac- titioners. By George E. de Schweinitz, M.D.	204
The Treatment of Typhoid Fever; and Reports of Fifty-five Consecutive Cases with only One Death. By James Barr, M.D., and Professor W. T. Gairdner	206
The Pathology and Treatment of Glaucoma. By Mr. Priestley Smith	207

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Note on Codeine Sulphate	209	Acute Poisoning by Phenic Acid	212
Treatment of Basedow's Disease	209	General and Local Treatment of Tuber- culosis by Inhalation	212
Phenocoll Hydrochloride	210	Anæsthesia by Cocaine	213
Solanine	210	Injections of Antitoxic Blood in Tetanus	213
Treatment of Epilepsy	210	Chorea Treated by Chloral Hydrate	214
Actæa Racemosa in Dysmenorrhœa and Ovarian Irritation	211	Treatment of Pleurisy	214
Treatment of Hepatic Colic by Glycerin	211	Rectal Injections in Influenza	214
The Therapeutic Action of Kola	211	Methylene-blue in Malarial Fever	214

MEDICINE.

A Variety of Sugar hitherto Not Ob- served in Urine	215	Hemorrhagic Nephritis	216
Exalgine in Graves's Disease	216	Tuberculous Pachymeningitis	218
		The Influenza	218

SURGERY.

Management of Compound Disloca- tions of the Ankle-joint	219	Case of Torticollis due to Hæmatoma of the Sterno-mastoid Muscle	221
Recent Cases of Œsophagotomy	220	Tuberculous Herniæ	221
Reflexes in Hip Disease	221	Severe Head Injuries	222

	PAGE		PAGE
Treatment of Varicose Veins of the Leg Complicated by Ulcers	222	Antisepsis and the Mercurial Salts	224
Toxic Action of Impure Chloroform	223	Aneurism of the Ascending Aorta	224
The Function of the Thyroid Gland	223	Loose Body in the Knee-joint due to Detachment of Articular Cartilages	225

DERMATOLOGY.

Pigmented Sarcoma of the Skin	226	New Method of Skin-grafting	229
Syphilitiform Erythema	226	Hydrargyrum Formamidatum in Syphilis	230
Heat in the Treatment of Syphilis	227	Sarcoma of Skin	230
Cod-liver Oil and Iodoform Locally in Lupus Vulgaris	227	Multiple Sarcomata	230
Case of Dermatitis Tuberosa from Iodide of Potassium	227	Lichen Scrofulosorum	230
Case of Lymphangioma	227	Treatment of Alopecia Areata	230
Lupus Vulgaris; Controversial Points	228	Molluscum Contagiosum	231
Favus and its Treatment	228	Histology of Molluscum Contagiosum	231
Pilocarpine in Diseases of the Skin	228	Mycosis Fungoides	231
Bassorin Paste in Skin Diseases	229	Value of Epilation	232
Dermatitis Hæmostatica	229	Tumenol and its Uses in Skin Diseases	232
Universal Erythema Multiforme	229	An Epidemic Skin Disease	233
		Etiology of Itching	233

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Thyroiditis	234	Chronic Diphtheria of the Nose	236
Thyroidectomy	234	Suppuration of the Maxillary Sinus	236
Thyrectomy in an Infant	234	Nasal Tuberculosis	236
Hysterical Aphonia Cured by Compression of the Ovaries	235	Deviations of the Septum Narium	237
Rhino-pharyngeal Adenoid Vegetations	235	Impairment of Voice due to Mucous Hypertrophies of the Nasal Septum	237
Trichloroacetic Acid in Nose and Throat	235	Tumors of the Tonsil	238

OBSTETRICS.

Umbilical Infection in 1000 Infants	238	Sudden Death during Puerperal State	240
Study of Puerperal Eclampsia	239	What Constitutes Essential Obstetric Antisepsis?	241
Condition of the Kidneys in Eclampsia	239	Instrumental Abortion for Pregnancy Complicated with Aortic Disease	241
The Bacteriology of Eclampsia	239	Treatment of Tubal Pregnancy	241
Condition of the Liver in Eclampsia	240		
Nephritis in the Pregnant Woman	240		

GYNECOLOGY.

Origin of the Graafian Follicle	242	Discussion of the Cervix	245
Sarcoma of the Urethra	243	Epithelioma of the Cervix Uteri	245
Operation for Accessory Ureter	243	Curetting for Uterine Fibroids	245
Development of the Female Urethra	243	Hysterectomy for Uterine Fibroids	246
Treatment of Pyosalpinx by Aspiration	244	Absence of the Kidney and Ureter	246
Micrococci in the Pus of Pyosalpinx	244	The Closure of Vesico-vaginal Fistulæ from the Side of the Bladder	246
Pelvic Emergencies causing Death	244	Gonorrhœal Salpingitis	247
Gonorrhœal Infection in Women	244		

PÆDIATRICS.

Excision of Cicatrices of the Neck	248	Secondary Pyrexia in Scarlatina	249
A Bacillus in the Blood of Measles	248	Tumors of the Bladder in Children	250

THE
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OF THE MEDICAL SCIENCES.

AUGUST, 1892.

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BY WILLIAM C. DABNEY, M.D.,
OF VIRGINIA.

THIS paper was suggested by several cases occurring in my own practice, or seen in consultation, in which some of the most characteristic of the usual symptoms or signs of hepatic abscess were wanting when such an abscess was present, or else in which the symptoms were singularly suggestive of the affection and yet no abscess existed.

It is based in great part upon the analysis of one hundred and eight cases collected from various sources, but I have in some places, when it seemed advisable, utilized other material as well as this.

The paper is not intended as an exhaustive review of the subject, but I trust the facts which I hope to bring out will help to clear up some of the obscure points in connection with this disease.

The first question which presents itself, of course, in any systematic study of suppuration in the liver is the nature of the germs or substances which cause this suppuration, but I do not feel qualified to express an opinion on this point. It seems to me, however—if I may venture to express *any* opinion—that the investigations of Hankin, Prudden, Hoenpyl, Welch, and others tend to show that there are quite a number of germs and substances which are capable of causing pus formation under favorable conditions.

That some bacteria or their products, however, are directly connected with the formation of hepatic abscess is almost if not quite certain, and we have next to inquire *from what points these bacteria or their products come and through what channels they reach the liver*. There are several

¹ Read before the Association of American Physicians at Washington, May, 1892.
vol. 104, no. 2.—AUGUST, 1892.

conceivable channels through which pyogenic germs or substances may reach this organ.

By the bloodvessels. Entrance of germs by the hepatic artery was formerly considered a common cause of hepatic abscess, and it was claimed that injuries of the head or of the bones generally were especially apt to cause this affection. Frerichs, for instance, stated that "the supervention of hepatic abscess from inflammation of the veins of the systemic circulation was of far more common occurrence than abscess arising from phlebitis of the portal veins;" but this view does not accord with the facts, so far as definite information can be obtained. Waldeyer found hepatic abscess in only six per cent. of those who died from surgical diseases, while embolic processes in the lungs were present in more than two-thirds; and Klebs found that "thirty-two cases with metastasis in the lungs occurred to eight in the liver."¹

Barensprung (quoted by Thierfelder) states that in thirty-three cases of traumatic diseases resulting from injuries of the head, hepatic abscesses were found in six; and Prescott Hewitt, in eighteen injuries of the head, found hepatic abscesses in three and abscesses of the lungs in thirteen.²

It would scarcely be proper to make any use of the records of our civil war in this connection, because the constant strain and pressure to which the surgeons both North and South were subjected during those troublous times left them but little time for careful pathological research; but it is not probable that if hepatic abscesses had been of frequent occurrence they would have been overlooked so completely by all the surgeons on both sides; and yet in 12,980 cases of injuries of the head which are reported in the first surgical volume of the *Medical and Surgical History of the War of the Rebellion* I can find no record whatever of an abscess of the liver and but one case which suggests this affection—death being attributed in this to "hepatitis." In addition to this one case of hepatitis, nine of pyæmia are reported, but the seat of the abscesses in these cases is not mentioned.

Of the one hundred and eight cases which I have tabulated for the purposes of the present study there is but one in which it seems in the slightest degree probable that the embolus leading to the hepatic abscess passed through the systemic veins and the hepatic artery to reach this organ. In this case, reported by Harris,³ a man entered the hospital for an ulcer on the leg; about two months after admission a hepatic abscess formed; was aspirated, and later incised and drained, and the patient recovered.

The occurrence of hepatic abscess in connection with or as a result of malignant endocarditis ought, it would seem, to be of comparatively

¹ Ziemssen's Cyclopaedia, vol. ix. p. 99.

² Holmes's System of Surgery, vol. i.

³ Lancet, O. 1, 1887.

common occurrence—much more common at least than in those cases where the primary disease is so situated that the embolus has to pass through the lungs before it can reach the arterial system; but, as a matter of fact, very few cases have been reported, so far as I can learn. Thierfelder refers to two—one reported by Mayer and one by Buckling—but the size of the abscesses in these cases is not mentioned. It is probable that this form of cardiac disease runs such a rapid course, and the general symptoms are so pronounced, that the hepatic disease is overlooked before death, and it is also probable that the hepatic abscesses would be of small size and little practical importance. We are justified in concluding, it seems to me, that the occurrence of hepatic abscess from injuries or diseases of the bones or other parts of the body, except those immediately adjacent to the liver, or else directly connected with the portal system of veins, is rare, and the slight danger which formerly existed in such cases has been in great measure removed by the anti-septic or aseptic method of treating wounds.

The conveyance of pyogenic germs or substances by the *hepatic veins* and the consequent formation of abscess in the liver must be extremely rare, if such a thing ever occurs. I can find no cases which seem to have originated in this way, though Younge states¹ that the large single tropical hepatic abscesses are connected with the hepatic veins; the small, multiple ones with the portal veins. There is abundant evidence, however, that the large so-called tropical abscesses are often, if not generally, connected with the portal vessels. Mr. Godlee says:² “It appears to be certain, also, that thrombosis and subsequent suppuration may occur in the hepatic veins or their tributaries,” but he gives no cases in proof of the statement.

Pyogenic infection through the portal system of vessels is usually considered the most common source of origin of hepatic abscesses, and in a very large proportion of cases which have been carefully studied there seems to have been ulcerative disease of some of the organs connected with the portal system or there was a history of such ulceration at some previous time. Thus, in one hundred and fifty-six cases of acute or chronic catarrhal inflammation of the intestinal mucous membrane *without* ulceration, occurring during our civil war, there was but one case of hepatic abscess, while there were fourteen cases of multiple abscesses and nine of large single abscesses occurring in five hundred and eleven cases of flux in which the intestine was ulcerated.”³ In a considerable proportion of cases, however, there is no history of previous disease of the intestines or any of the organs connected with the portal system.

Of the one hundred and eight cases which I have studied, there were

¹ Med. Press and Circular, Aug. 14, 1889.

² British Medical Journal, 1890.

³ Medical and Surgical History of the War of the Rebellion, vol. ii. p. 548.

only forty-seven in which there had been a history of disease of any of these organs or in which post-mortem examination showed that such disease had existed; and in one, at least, of these cases the dysentery had existed so long before (eight years) that its connection with the hepatic abscess is *extremely* doubtful. Of the forty cases reported by physicians in this country, eleven were apparently due to disease of the organs connected with the portal system, and in sixteen the cause was unknown; in several of these cases it was distinctly stated that there was no history of diarrhoea, dysentery, or any other disease. The individual diseases and injuries of the organs connected with the portal system to which hepatic abscess has been attributed are (1) dysentery, (2) appendicitis, (3) gastric and duodenal ulcer, (4) operations on or diseases of the rectum, (5) typhoid fever, (6) suppuration of the umbilical veins in infants, (7) ulceration of cervix uteri, (8) peri-uterine inflammation, (9) suppurating ovarian cysts, (10) lithotomy operations.

Before going further it will be well to call attention to the fact that the word "pyæmic" in connection with hepatic abscess is used differently by different writers on the subject.

It is used by some to denote all those abscesses which result from the lodgment of an embolus in the bloodvessels of the liver, and by others it is restricted to those cases which occur in connection with well-marked symptoms of general septicæmia. While it is hard, perhaps, to draw a fast and sharp line between these two classes of cases, it seems to me better, from a clinical point of view, to use the word pyæmic in the restricted sense. The first fact which strikes one in connection with ulceration of the intestinal canal and hepatic abscess is that all forms of ulceration do not lead to abscess. Sir Dyce Duckworth states¹ that it does not result from either tubercular or typhoid ulceration. As to the second of these he is clearly mistaken, as I shall show a little later on, but I have not been able to find any cases which were clearly due to tubercular ulceration of the bowel. In the case reported by Thorowgood,² it is probable that the pus-like collections in the liver were really broken down tubercle and not pus. A probable explanation of the circumstance that tubercular ulcers of the bowel do not cause hepatic abscess is to be found in the fact that tubercles are so scantily supplied with bloodvessels.

The ulceration of typhoid fever is a rare source of abscess of the liver. Bernhard reports³ a case following typhoid fever and terminating fatally in which the cicatrices of the typhoid ulcers were found at the autopsy. Musser refers⁴ to a case in which the intestinal ulcers had healed, but the mesenteric glands had supplicated. It is not easy to understand why

¹ Lancet, April 23, 1887.

² Ibid., 1889, ii. p. 268.

³ Jahrb. für Kinderheilk., 1886, p. 303.

⁴ Cyclopædia of Dis. of Children.

hepatic abscess should be so rarely connected with typhoid ulceration. Arnaud advanced the view¹ that it was due to the fact that Peyer's patches are connected with the lymphatics, and that the vessels are comparatively little involved in typhoid fever, but this view is scarcely tenable. Luchtmanns² found "follicular ulcers" of the intestines in sixty-one of one hundred and two cases of hepatic abscess, and, furthermore, Peyer's patches are very abundantly supplied with bloodvessels.

Ulceration of the bowel, which often causes dysenteric symptoms, and hence is spoken of as dysentery simply, is usually considered the most common cause of hepatic abscess; but it was frequently remarked, even before the investigations of Councilman and Lafleur, that the dysentery was unlike the common form, and was often mild in character.

Younge mentions³ that dysentery was extremely common during the Crimean war, but only one hepatic abscess was reported, and he refers also to the statistics of Niemeyer and of Finger, who report three hundred and eleven autopsies in cases of dysentery without finding a single hepatic abscess. Cullimore states⁴ that he was informed by Dr. Danford Thomas that he never saw a case of hepatic abscess during his term of service as coroner of London. Sir Dyce Duckworth says⁵ that ordinary dysentery does not cause hepatic abscess, and Bartholomew⁶ makes a similar statement.

In many cases the ulceration of the bowel and the dysenteric symptoms are so mild in character as scarcely to attract attention. Dickinson reports⁷ a case in which there was a large hepatic abscess, with no symptoms or history of dysentery, but at the autopsy ulceration of the colon was found. Keiner and Kelsch refer⁸ to a case reported by Moxon to the Medical Society of London, in which diarrhœa was present for one day only; death occurred from the opening of an hepatic abscess into a large vein, and at the autopsy a very small ulcer was found in the colon.

De Gennes and Kirmisson report⁹ a case in which the discharges from the bowels were abundant and glairy in character, and there was little tenesmus.

In many cases, on the other hand, the ulceration of the bowel is deep and extensive, as in the cases described by Councilman and Lafleur.

It is evident, therefore, that so far as ulceration of the bowel is concerned, the hepatic abscess is not due to the character of the intestinal ulceration; and it is almost certain, if not positively established, that it

¹ Marseille Méd., 1887, p. 146.

³ Med. Press and Circular, August 14, 1889.

⁵ Loc. cit.

⁷ Trans. Path. Soc. of London, 1862.

⁹ Ibid., 1886, ii. p. 288.

² Quoted by Thierfelder.

⁴ Ibid., November 30, 1887.

⁶ Pepper's System of Medicine.

⁸ Archives Gén. de Méd., Sept. 1888.

is due to the character of the substances formed in the intestinal ulcers, and carried thence to the liver.

There are two or three other questions in connection with hepatic abscess consequent on dysentery which are of interest, namely: (1) How soon after an attack of dysentery commences may hepatic abscess develop? and (2) How long a time must elapse after apparent recovery from dysentery until the danger of hepatic abscess is over?

To the first of these questions a definite answer can be obtained. In the cases of amœbic dysentery reported by Councilman and Lafleur there was distinct evidence of pus formation in the liver in three weeks in two cases and in five weeks in one case. Indeed, they themselves put the time¹ at two weeks in one case, but they say the usual time was from the fourth to the twelfth week. In a case reported by De Gennes and Kirmisson the intestinal trouble occurred early in September and lasted fifteen days; the abscess had clearly formed by September 20th, and was aspirated October 17th. Geschwind reports² a case in which, three weeks after the first symptoms of dysentery, pus was expectorated; a little later a small quantity was aspirated, and then an incision was made through which three-fourths of a litre were discharged.

A case almost exactly similar is reported by Barthélemy and Bernardy,³ pus being obtained on aspiration in three weeks from the commencement of the dysenteric attack, and the case being then treated by free incision, with recovery.

It is extremely difficult—practically impossible, in fact—to say how long a time must elapse after *apparent* recovery from dysentery before the patient is free from the danger of hepatic abscess. There are two obvious difficulties in the way. In the first place, ulceration of the bowel may continue long after the dysenteric symptoms have disappeared, and, secondly, an hepatic abscess may remain latent for an indefinite time. Cullimore states⁴ that of twelve cases occurring in his practice in India, dysentery “immediately preceded” the abscess in only two. Lamb has reported⁵ a case in which a man had dysentery in August, and an hepatic abscess showed itself the following December; but in this case, though the dysenteric symptoms had disappeared four months before, the cæcum was found ulcerated at the autopsy. Muselier reports⁶ a case of multiple abscesses of the liver, in which the man had dysentery in Guadaloupe some months before. In another case the patient had dysentery six months before the abscess appeared, and Olliphant reports⁷ a case in which “diarrhœa” occurred a year before. A

¹ Johns Hopkins Hospital Reports, vol. ii. p. 466.

² Arch. de Méd. et Pharm. Militaire, 1889, xiv. p. 203. ³ Ibid., 1890, xv. p. 288.

⁴ Loc. cit. ⁵ New Orleans Med. and Surg. Journ., February, 1887.

⁶ Gaz. Méd. de Paris, November, 1885.

⁷ New Orleans Med. and Surg. Journ., May, 1887.

case presenting several peculiar features is reported by Guyot:¹ A man, thirty-eight years old, had suffered with chronic dysentery, but he had apparently recovered three years before the hepatic abscess appeared. In September he was taken sick with indigestion, weakness, pain in the right flank, and gradual emaciation; *he had no fever*; by January there was decided swelling on the right side, and great pain and tenderness; aspiration showed the presence of pus, and a month after one aspiration, at which 1500 grammes of pus were withdrawn, the patient was well. Quite a number of cases have been reported in which dysentery preceded abscess formation by several years; thus, O'Donnell,² after stating his belief that ulceration of the bowel is a rare cause of hepatic abscess outside the tropics, mentions a case in which dysentery preceded the abscess by nine years; and Faunce and Rowan report³ a case of abscess occurring eight years after dysentery. At first sight one would suppose that there could be no possible connection between the dysentery and the hepatic abscess in these cases, nor is it probable that there *was* any connection, but it is certain that ulceration may exist in the bowels for a long time after apparent recovery from dysentery, and an hepatic abscess may remain latent for a long time certainly, but just how long is not known. Another interesting fact just here is that dysentery may recur in the same person one or several times after an interval of several months or even several years. A case of this kind has recently come under my observation. A gentleman was taken, in the autumn of 1881, after a visit to a marshy section of Virginia, with a severe attack of dysentery; he recovered in a few weeks' time, but in 1884 and in 1888 he had similar attacks. In January last he was again attacked, and I saw him in consultation in February. An examination of the discharges, made by my colleague, Prof. Tuttle, showed that they contained amœbæ. The case ran a tedious course, but finally ended in recovery.

The entrance of pyogenic substances into the liver by the *lymphatics* is of questionable occurrence; but it seems to me highly probable that the frequent extension of such abscesses into the adjacent pleura and lung may occur through the lymphatic vessels of the liver, "which communicate with the thoracic lymphatics through the triangular ligament and suspensorium."

Suppuration may occur around the *bile-ducts* and lead to abscess formation from several different causes: (1) Retention of bile;⁴ (2) the

¹ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1886, p. 368.

² Med. Press and Circular, June 19, 1889.

³ Indian Med. Journ., 1888, p. 539.

⁴ Godlee says the simple distention of the bile-ducts does not cause abscess; that it only occurs when some foreign body, such as a gall-stone or a worm, causes ulceration of the duct.

presence of gall-stones; (3) the entrance into the ducts of intestinal worms; (4) probably, also, from an angiocholitis of unknown origin.

Cases of this character do not seem to be very common when compared with the total number of hepatic abscesses reported, but if so-called tropical abscesses be left out, they are probably comparatively common. Musser has collected seven cases in which the abscesses were caused by round worms, and other cases have been reported. One of the most remarkable was reported¹ by Bates a number of years ago. A negro child, three years old, was taken with violent pain in the belly, paroxysmal in character and very severe; there was great tenderness over the region of the liver, and the organ was somewhat enlarged; the child lived nine days. At the autopsy two abscesses were found in the liver, one of which contained one and one-half ounces of pus; in addition to these abscesses, however, forty-two round worms were found in the substance of the liver, and similar worms were found in the intestines.

Of thirteen cases of multiple small abscesses collected by Carrington,² three were due to obstruction to the outflow of bile. Leyden also reports³ a case of multiple small abscesses due to gall-stones, and a similar case is reported by Harris.⁴ In Harris's case there were many small abscesses in the pancreas, as well as in the liver. So far as I can learn from the reported cases, abscesses which originate from trouble about the bile-ducts are usually small in size and multiple, but this is not always the case. Polaillon⁵ reports a case of very large single abscess beginning as an angiocholitis, and Kermisson⁶ one due to gall-stones in which there were one large and several small abscesses. The abscesses were in the right lobe. The biliary canals were "enormously dilated," the pus was thick and yellow, the wall of the abscess dark, and small bloodvessels opened into the abscess; there was also a small abscess in the right lung.

Spread of suppurative inflammation from adjacent parts or organs may occasionally induce hepatic abscess. Beckham has recorded⁷ a case in which an abscess originally between the abdominal wall and liver, or possibly in the abdominal wall, extended to the liver, and caused erosion or ulceration of its outer surface; there was a fistulous opening into the sac, through which pus and fragments of hepatic tissue were discharged. Councilman and Lafleur think it probable that there was a direct passage of amœbæ from the colon to the liver in some of their cases of amœbic dysentery.

¹ New Orleans Med. and Surg. Journ., March, 1846.

² Guy's Hosp. Reports, vol. xxvi.

³ Charité Annalen, 1886.

⁴ Indian Med. Journ., 1885, p. 603.

⁵ Gazette Méd. de Paris, June 18, 1887.

⁶ Bull. Soc. Anatomique, 1873, p. 674.

⁷ New Orleans Med. and Surg. Journ., 1867, p. 67.

In the cases where it was supposed to result from pneumonia, it is more probable that the abscess was the primary condition, and the pneumonia resulted from it.

Injuries of the liver lead to hepatic abscess in a considerable number of cases, and these injuries may be penetrating wounds, simple contusions without external injury, or they may cause fracture of the ribs, and lead to hepatic abscess, and possibly cause hepatic abscess secondarily.

I can find but three cases of hepatic abscess from penetrating wounds of the liver reported in the *Medical and Surgical History of the War of the Rebellion*. One of these was from a punctured sabre wound, and the other two from shot injuries. In each case the abscess resulted very soon after the receipt of the injury.

As a rule, the abscesses due to other forms of injury, such as blows, appear in a few days. Eight of the one hundred and eight cases in the table were clearly due to injuries, and in these cases the interval from the receipt of the injury to the appearance of the abscess varied from four to thirteen days. Thus Barthélemy and Bernardy report¹ a case in which the abscess appeared four days after a blow; Tournier,² one four days after a blow on the belly and exposure to cold; Barth,³ one in which the liver was enlarged in three days, though pus was not aspirated for three months; Siredey,⁴ one in which a man received a kick from a horse, and pus was present in eight days, and Weir,⁵ one in which, after a fall on the buttocks, an hepatic abscess formed in thirteen days. In two cases the interval between the injury and the abscess formation is not stated, and in three, while the abscesses were supposed to have been due to injury, the evidence is by no means conclusive.

I shall have but little to say about the *general or local conditions which are favorable to the development of hepatic abscess*.

A *hot climate* is universally considered a potent factor, but it is quite evident that it is not the *heat* simply which is the active agent, because the disease is not equally common in all hot countries.

Perhaps the chief action of heat is in furnishing one of the conditions requisite for the growth and development of amœbæ; it is probable that those abscesses which are so greatly influenced by climatic conditions are amœbic in character.

Harley,⁶ Cullimore,⁷ and Younge⁸ think chilling of the body when

¹ Archives de Méd. et Pharm. Militaire, 1890, xv. p. 285.

² Provence Méd., November 22, 1890.

³ Bull. Soc. Anatomique, 1856, p. 111.

⁴ Ibid., 1858, p. 499.

⁵ New York Med. Record, April 29, 1882.

⁶ Med. Press and Circular, February 3, 1886.

⁷ Ibid., November 30 and December 7, 1887.

⁸ Ibid., August 14, 1869.

overheated a potent cause, and Cullimore claims that horseback riding is liable to induce it.

There is much difference of opinion with respect to the influence of *malaria*, but the weight of evidence seems to be clearly against any connection between the two diseases. Cullimore, Keiner and Kelsch, Dutrolau—in fact, nearly all writers on tropical affections—deny such a connection. Blanc,¹ on the other hand, considers *malaria* a powerful, predisposing cause, and Tomes² thinks *malaria* a frequent attendant on hepatic abscess. The rarity of hepatic abscess in those sections of the eastern part of the United States where *malaria* prevails, furnishes strong presumptive evidence against any connection between the two diseases; but Bartholow states that hepatic abscess is common in the Mississippi Valley, and of twenty cases occurring in the St. Louis Hospital reported by Robinson,³ in ten “intermittent fever,” “chills and fever,” or “chills” are mentioned as causative or complicating conditions. In seven of the ten cases, however, dysentery or diarrhœa had preceded the abscess; in two of the other three cases the chills and fever occurred during the time the abscess was forming, or after it had formed, and in the other there had been no chills for four years until about six weeks prior to the appearance of the abscess.

Mr. Godlee,⁴ in his lectures on the “Surgical Aspects of Hepatic Abscess,” states his belief that *malaria* is sometimes connected with abscess formation in the liver. It seems to me probable that the only real connection between *malaria* and hepatic abscess is to be found in the fact that the same conditions are favorable for the development of the plasmodium *malariae* and the amœba of amœbic dysentery. Possibly *malaria* may weaken the resisting power of the liver, and thus act as a predisposing cause also.

Intemperance is universally recognized as a predisposing cause of hepatic abscess in India, and it is probable that it is elsewhere. It is worthy of note, too, that even “moderate drinkers” are very liable to the disease in India. Hatch⁵ reports seventeen cases; of these seven used liquor to excess, and nine were moderate drinkers.

With respect to *age and sex*, adult males are far more liable to hepatic abscess than children or women. Chiefly, perhaps, because they are more exposed to the predisposing and exciting causes; but young people are by no means as exempt from this affection as was formerly supposed. Musser⁶ has collected thirty-four cases in persons under fifteen years old, and many other cases have been reported. Thus Hill records⁶ the

¹ Lancet, February 20, 1886.

³ St. Louis Courier of Medicine, January, 1879.

⁵ Indian Med. Journal, 1887, p. 204.

⁶ Cyclopædia of Diseases of Children, vol. iii.

² Lancet, October 9, 1886.

⁴ Lancet, January 5, 1889.

case of a boy nine years old, who had suffered from repeated attacks of periodical fever, in whom an hepatic abscess developed. It was incised and drained, and discharged nearly half a pint of greenish pus.

McClelland reports¹ the case of a girl eight years old, who swallowed a pin fourteen months before, and "about that time" had pain in the right groin; the case terminated fatally, and at the autopsy, one abscess the size of an orange, and many smaller ones were found in the liver, and one in the brain.

A case is also reported² by Pereira in a child twenty months old who had dysentery in November, and the abscess appeared in the following December.

Janeway has also reported³ a case in a child three years old, and the case reported by Bates in a child of three years, has already been alluded to.

The usual *seat*, the *number*, and the *size* of hepatic abscesses are points of great practical importance with respect to prognosis and treatment.

The usual seat of an abscess is in the right lobe, and even when the abscesses are multiple, the right lobe is chiefly involved. Furthermore, it would seem that the *upper* part of the right lobe is involved rather more frequently than the lower part.

With respect to the number of abscesses, it is hard to get definite information. Of the 108 cases which I have studied there were multiple abscesses in 42 cases; while in 55 there was but 1; in 11 cases the number of abscesses were not stated. In those cases which complicate general septicæmia, it is quite certain that the abscesses are in the great majority of cases multiple in number and small in size, but these cases are of little *practical* interest at any rate, and it is of far more importance to determine, if possible, the size and number of the abscesses in those cases which offer some hope of relief from remedial measures.

Of the 8 cases in which the disease was *clearly* due to injury, there was but *one* abscess in 4 cases; in one there were 2; and in one 6; and in one (Siredey's case) "many;" in the other the number is not mentioned, but it would appear from the context there was but 1.

Of the 4 cases *probably* due to injury, in 2 there was but 1 abscess; in 1 there were several; and in 1 the number is not stated.

Of the 31 cases in which there was a history of either dysentery or diarrhœa, or in which ulceration of the large bowel was found, at the autopsy there were multiple abscesses in 15 cases.

In 14 cases there was but 1, and in 2 the number is not stated. Of

¹ Lancet, April 10, 1886.

² Indian Medical Gazette, June, 1890.

³ Trans. New York Med. Assoc., 1884.

38 cases in which the cause of the abscess could not be discovered, 27 were single, 9 multiple, and in 2 the number was not stated.

Eighteen of these 38 abscesses were reported in the United States, and of the 18, 15 were single, 2 multiple, and in 1 the number was not stated.

Twelve were reported by French physicians, and of the 12, 4 were multiple.

Eight were reported by English physicians, and of these 4 were multiple and 4 single.

One of the American cases reported here as one of multiple abscesses presented peculiar features. It is reported by Schoolfield in the *Cincinnati Lancet and Clinic* for December 28, 1889. In this case there were four abscesses, but they appeared at different times. The first burst into the lung, and a month after apparent recovery another abscess appeared, which was incised and drained in two weeks. Recovery seemed to be complete in a month's time, but two months after the second apparent recovery, a third abscess appeared, which was incised and drained in three weeks time; recovery was slower then, and was only complete after four months. Two months later still the abscess recurred for the third time, broke into the lung and abdominal cavity and caused death.

A somewhat similar case of recurrent abscess has been reported by Rozemont-Malbot. The first abscess in this case broke and recovery ensued; a second appeared twenty months later, was incised and drained, and the patient was well in forty days; five months later a third abscess appeared and was incised, but general peritonitis supervened and terminated fatally.

Of 8 cases of abscess due to obstruction of the bile-ducts, 7 were multiple and 1 single, and it is questionable whether that was actually located in the liver. In only 1 of the cases was there a large abscess.

Carrington has reported a case in which there were two large and many small abscesses, and he considered the combination very rare; but this view is clearly erroneous, as 7 other cases appear in the 108 which I have collected, in which there were one or two large, with many small abscesses in the same liver.

The relation of multiple abscesses to each other is a matter of direct and practical importance. In a general way it may be stated, perhaps, that the longer a case lasts the greater the probability that multiple abscesses will open into each other, but this fact does not, of course, justify delay in surgical treatment, because the longer the duration the greater, as a rule, is the destruction of hepatic tissue, and the greater is the danger of exhaustion or of the bursting of the abscess in some unfavorable direction. That the presence of one or more additional abscesses may cause death, after one has been opened and drained,

there can be no question. Ferron, for instance, reports¹ 47 cases of antiseptic hepatotomy for abscesses, in 8 of which the abscesses were multiple. Of the multiple cases 5 terminated fatally, while there was but 1 death in the 39 cases of hepatotomy in which the abscess was single.

Tournier has also reported² an interesting case of hepatic abscess due to injury, the presence of pus being evident four days after the injury was inflicted. One abscess in this case was opened by Vienna paste and incision, but the case terminated fatally, and at the autopsy another abscess was found which had not been opened.

A somewhat similar case is reported by Arnaud,³ in which the patient died twelve days after incision into one abscess; at the autopsy the abscess was found healed, but there was another present which had caused death.

Sometimes (how often I have not been able to learn) a second abscess will burst into the one which has been opened. Thus, Cliquet reports⁴ a case in which an abscess was incised and drained; there was temporary improvement, but fever, sweats, pain, and prostration recurred. Twenty-four days after the incision there was a sudden and profuse flow of pus, with immediate relief.⁵ It seems to me highly probable that the bursting of a second abscess into the cavity of one which has been opened must be of comparatively common occurrence, because the recoveries from hepatic abscess, when one sac only has been opened, are relatively much more frequent than single abscesses.

I shall have but little to say about the *contents* of an hepatic abscess, but there are two or three practical points which it may be well to mention. The first of these relates to diagnosis. It seems to be generally held that aspiration is quite a certain means of detecting the presence of pus, but this is clearly a mistake. Councilman and Lafleur mention the fact that in some of their cases of amoebic abscess the contents were so thick that they would not flow through an aspirator needle, and in a case which I saw in consultation a year or two ago the contents of the abscess had undergone caseous degeneration, and aspiration gave a negative result.

It would be interesting to determine how long it takes for pus in the liver to undergo this caseous change, but there are hardly any facts

¹ Gazette hebdom. de Sci. Méd. de Bordeaux, 1887, p. 159.

² Provence Méd., November 22, 1890.

³ Marseille Méd., 1887, p. 146.

⁴ Archives de Méd. et Pharm. Militaire, 1896, i. 299.

⁵ I have recently seen a similar case in consultation. I incised and drained one abscess on May 15th; the patient improved greatly for a time, but fever and sweats recurred. On June 20th another abscess burst and discharged through the original opening, and on June 24th a third opened in the same way.

which throw light on this point. Nor would it be easy to determine it, at any rate, because of the frequency with which abscesses are latent.

In the single case which I have seen, it was about six weeks from the time the first symptoms of abscess appeared, till aspiration was attempted. The second point of practical interest in connection with the contents of an hepatic abscess is the frequency with which the contents are sterile. "Bacteria were found in 3 of the 6 cases" reported by Councilman and Lafleur. Laveran has reported¹ 2 cases which were sterile, and Netter, in the discussion following the reading of Laveran's paper, stated that of 13 cases of amœbic dysentery, Kartulis had found 8 sterile; of 9 cases of "idiopathic abscess of hot countries" 4 were sterile. He expressed the opinion, too, that the sterility was due to the long time the abscess had lasted—an opinion which is scarcely tenable in view of the rapid course of some of Councilman and Lafleur's cases.

Peyrot² has reported a case in which pus from an hepatic abscess of unknown origin escaped into the peritoneal cavity without any subsequent trouble, and he attributes the absence of peritonitis to the sterility of the pus. This sterility of the pus, or its *possible* sterility, might furnish a crumb of comfort when pus did escape into the abdominal cavity; but it would certainly not justify the failure to prevent such contamination as far as possible.

The presence of liver-cells in the contents of an hepatic abscess does not seem to be of very common occurrence. It is mentioned in 8 of the 108 cases. Occasionally their presence is of great value in diagnosis. A few years ago I saw a gentleman from Cincinnati who was supposed to be suffering from phthisis. At my first visit I found he had been taken a few hours before with profuse discharges of yellowish matter from his bowels. On microscopic examination these were found to consist of pus and fragments of hepatic tissue and liver-cells.

The condition of the walls of the abscess and the surrounding hepatic tissue depends in great measure on the duration of the abscess. In the very early stages there is no very sharp line of demarkation, but later on, the walls are distinct and ragged; still later, they may be thick and fibrous, and Haspel (quoted by Frerichs) states that the fibrous wall may be formed in twenty or twenty-five days; but it is evidently very hard, if not impossible, to say how long a time is necessary for this change in the wall to occur, for abscesses having such fibrous walls pursue a tedious course, and are often latent.

The surrounding tissue is often sound, but it may be fatty, as in cases reported by Dymock³ and Arnaud.⁴

¹ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1890, p. 691.

² Bull. et Mém. de Soc. de Chirurg., February and March, 1891.

³ Indian Med. Gazette, 1866, p. 298.

⁴ Marseille Méd., 1887, p. 146 et seq.

The changes in the neighboring parts and organs are of great practical importance, especially the presence or absence of adhesions.

In 30 of the 108 cases which I have tabulated, the presence of adhesions is mentioned.

In 8 it is mentioned that there were *no* adhesions.

In 70 cases no mention is made of adhesions, one way or the other.

In 11 of the 30 cases, the abscess was due to dysentery, and in 7 of the 11 cases there were multiple abscesses.

In 16 cases the cause of the abscess was unknown, and in 5 of these there were multiple abscesses.

Adhesions were mentioned in only 1 case, when the abscess was due to injury, and then the adhesions were between the liver and the diaphragm.

In 20 of the 30 cases the liver was adherent to the abdominal walls.

A comparison of the symptoms present in those cases where adhesions existed, and in those where there were *no* adhesions, does not indicate any means by which their presence or absence may be determined.

Cliquet¹ thought that œdema of the abdominal walls over the seat of the liver was an evidence of adhesions having formed, but this view cannot be substantiated. The presence of this symptom is noted in only 2 of the 30 cases, and Ramonet has reported² a case in which this symptom was present, and in which he distinctly states adhesions were not present.

In 1 other case, however, not included in the 30, where adhesions certainly existed, there was extreme œdema of the skin, and adhesions probably existed because there was necrosis of the ribs in this case.

The *symptoms* of hepatic abscess are usually quite well marked, but are sometimes obscure and occasionally there are no symptoms pointing to hepatic disease.

Thus, Woolbut records³ a case in which a laboring man, in apparently perfect health, was suddenly seized with severe pain in the abdomen, followed by collapse, and terminating in death in a few hours' time; he had received no injury of any kind and had not had dysentery; at the autopsy, the left lobe of the liver was found ruptured, and in the right lobe were found one large and several small abscesses, the presence of which had never been suspected.

McLean⁴ speaks of a case in which a man died of phthisis, who had never presented any symptoms of hepatic trouble, but at the autopsy a cavity the size of a walnut, and containing a rusty needle swallowed two years before, was found in the liver; the abscess-cavity opened into the duodenum and drained in that way. He mentions also another

¹ Loc. cit.

² Archives de Méd. et Pharm. Militaire, 1889, p. 321.

³ Indian Med. Gazette, December, 1886.

⁴ Reynolds' System of Medicine.

case, in which a man with "no previous history of disease" walked seven or eight miles in search of work; soon afterward he complained of sudden pain, became collapsed, and died in a very short time. At the autopsy a large abscess with very firm walls was found which had suddenly burst into the pericardium.

Even close adhesions to surrounding parts may form apparently without giving rise to any symptoms; thus Rohé reports¹ a case in which a woman died quite suddenly with pneumonia; there had been no hepatic symptoms during life; but at the autopsy an abscess holding four ounces was found in the liver, which contained several gall-stones, and was adherent to the stomach, pancreas, duodenum, and gall-bladder.

Tournier (*Provence Méd.*, November 22, 1890) reports a case also in which there were no symptoms pointing to the liver, but in which, at the autopsy, an hepatic abscess was found, and the organ was found closely adherent to the abdominal wall.

McLean expresses the opinion that those cases which present no symptoms are very chronic in course, and the abscesses have thick walls, but this is not always the case.

Souques has recorded² a case following old perityphlitis, which presented no symptoms pointing to the liver, but which ran a rapid course, and caused death before rupture of the abscess.

The *onset* of the symptoms in most cases of hepatic abscess is gradual, but now and then is very sudden.

Thus, in a case reported by Ferrand,³ the patient was taken suddenly with violent pain in the abdomen, with vomiting; he was constipated, but an enema brought away black, offensive matter; the symptoms continued; fever supervened, and the liver became moderately enlarged; death occurred in a month's time, and at the autopsy a number of abscesses, from the size of a bean to that of a pullet's egg, were found, containing grumous muco-pus; the walls were blackish and gangrenous, and there were adhesions to adjacent parts.

Of the usual symptoms of pus-formation—*rigors, fever, and sweating*—fever was present in a very large proportion of the cases.

Its presence is distinctly mentioned in 61 of the 108 cases; there was said to be an absence of fever in 5 cases, in which other symptoms of hepatic abscess were present, but the records are not sufficiently full to be satisfactory on this point. I am at this time attending a case in consultation, in which there is no fever during the day, but at night a rise followed by sweating.

The temperature, except in cases which ran a very rapid course, did

¹ Med. and Surg. Reporter, November, 1881.

² Bull. Soc. Anatomique, 1889.

³ Bull. et Mém. de Soc. Méd. des Hôpitaux, 1887, p. 496.

not usually rise above 102.5° or 103° in the afternoon, and in the morning was often normal; the temperature elevation, furthermore, in most cases occurred at irregular times.

In 44 cases no mention is made of fever, but it is probable that it was present in most of the cases at least.

The occurrence of *rigors* is mentioned in 14 cases only, and sweats are said to have occurred in only 9. Doubtless, in many cases, both the rigors and the sweating were overlooked, but in quite a number of cases it is distinctly stated that they were absent.

Jaundice seems to be present, so far as can be judged from the limited number of cases which I have analyzed, more frequently than is commonly supposed. Its presence is mentioned in 11 of the 108 cases. In two of these cases the jaundice was very slight, however; in one of them there were no adhesions present, and in the other it is not stated whether adhesions were present or not. Of the 9 remaining cases, in 4 there were more or less dense adhesions surrounding the liver or connecting it with adjacent organs; and in the other 5 the jaundice was due to the presence of gall-stones, or other obstruction of the duct, which had given rise to the hepatic abscess. It seems to me highly probable, therefore, that in most cases of hepatic abscess in which jaundice is present this latter symptom is due not to the abscess itself, but to pressure on the bile-ducts by adhesions, or to obstruction by gall-stones.

An *earthy tint* of the skin is mentioned by many of those who have reported cases of abscess of the liver as of common occurrence.

Ascites is reported as present in 6 cases; in one of these the probable cause was suppurative portal phlebitis; in 4, more or less dense adhesions were present, and in 1 the presence or absence of adhesions is not mentioned.

The *digestive* symptoms are variable. There is usually complete loss of appetite, but occasionally it remains good.

Nausea and *vomiting* were noted in 13 of the 108 cases, and in only 6 cases were their absence specifically mentioned.

Diarrhœa was present in 18 cases, and constipation in 10. In 2 cases there were alternate diarrhœa and constipation. In 1 case it is distinctly stated that the bowels were regular. It is evident, therefore, that the condition of the bowels is of but little value as a symptom of hepatic abscess.

Disturbance of the *nervous system*, except pain and tenderness in the region of the liver, which will be considered hereafter, is rarely mentioned. The occurrence of headache is mentioned in 3 cases, delirium in 2, and stupor in 1. No doubt in many cases there were nervous and other symptoms, which are not mentioned by the reporters of the cases; but if these symptoms had been conspicuous, it is scarcely probable that they would have been omitted.

Disturbances of the *circulatory system*, except ascites and weakness of the pulse, were very rarely mentioned. In 1 case there was enlargement of the superficial veins of the abdomen; the abscess in this case supervened "very shortly" after a blow over the liver; the patient lived three months, and at the autopsy the liver was found adherent to the diaphragm on the right side; there were no abdominal adhesions; there was some effusion (serous) in the left pleural and in the pericardial sacs. In another case there was repeated epistaxis, and in a third the pulsations of the heart were communicated to the abscess.

Disturbances of the *respiratory system* are quite common. *Dyspnea* is mentioned as a troublesome symptom in 12 cases, and *cough*, which was not usually very troublesome, however, is mentioned in 8 cases. The existence of râles, usually subcrepitant, is mentioned in a few cases, and occasionally pleuritic friction-sounds were observed. There would seem to be several causes for the disturbances of respiration in cases of hepatic abscess: (1) The pain occasioned by breathing; (2) the pressure of the abscess upward upon the lung; (3) the bursting of the abscess into the lung; (4) the bursting of the abscess into the pleural cavity; and (5) the existence of pleurisy (which may be serous) as a complication.

Disturbances of the *urinary system* are mentioned but three times in the one hundred and eight cases. Once the presence of albuminuria (five per cent.) was noted. The cause of the abscess in this case was supposed to be a wound by a pistol-ball received two years before. It is worthy of note that the spleen was enlarged in this case. The abscess was incised and drained, and the case ended in recovery. In view of the small amount of albumin present and the extreme rarity of the complication, it is probable that its presence was not connected in any way with the hepatic abscess. In only two cases, so far as I can learn, was any careful examination of the urine made to determine the amount of urea present. Both of these cases are reported by Arnaud,¹ and in one one hundred and thirty-five grains of urea were discharged a day; in the other, one hundred and twenty-three. The amount of the other constituents of the urine is not stated, nor is any statement made with respect to the presence or absence of leucin and tyrosin.

Emaciation is probably present, in greater or less degree, in nearly all cases, though it is only mentioned specifically in twenty-one of the one hundred and eight cases; in some cases, however, it is absent. In a case which I saw a few years ago there was scarcely any loss of flesh, and the thick layer of adipose tissue on the back prevented us from detecting the enlargement of the liver, which was in the back part of the right lobe. Rouis, quoted by Frerichs, says that in three cases he had seen great increase of adipose tissue.

¹ Loc. cit.

The evidence furnished by a *physical examination* of the liver is of far more value than the symptoms in cases of hepatic abscess. Of the eighty-nine cases in which the symptoms are given in some detail, *pain and tenderness* are mentioned as prominent in fifty-six; in four there was tenderness without pain; in two there was complete absence of both pain and tenderness; in the others no mention is made of pain one way or the other.

The character of the pain varies: sometimes it is quite steady; at others it occurs in paroxysms. The seat of the pain is also different in different cases, and seems, as a rule, to depend upon the direction in which the abscess is pressing; if it is pressing upward against the lung the pain is usually under the right scapula or in the right shoulder, though this does not always occur. Thus, in a case reported by Arnaud, the abscess pushed the lung upward very considerably, and yet there was no pain in the shoulder or scapular region. If, on the other hand, the abscess is on the under or front surface of the liver, the pain is usually in the epigastric or hypochondriac region. We have already seen, however, that pain may be entirely absent in such cases, even where adhesions have formed or are forming.

Enlargement of the liver, to a greater or less degree, is present in nearly all cases; it is usually sufficiently great to be plainly evident on palpation and percussion. Of the eighty-nine cases in which the symptoms are mentioned in detail, enlargement was named in sixty-three, and it was probably present in nearly all the others, for in some of them fluctuation is mentioned, and in some aspiration was practised and revealed the presence of pus. In three cases the enlargement was said to be slight; in two of these three cases the abscess was due to dysentery which had first appeared in one case two weeks and in the other three weeks before the abscess became apparent, and was incised. In the other case it was due to a blow; the abscess symptoms appeared four days after the injury, and incision was practised twenty-eight days after.

In two cases it is distinctly stated that the liver was not enlarged; one of these cases was due to dysentery, and the abscess itself was large and single; in the other there were multiple abscesses following obstruction of the bile-duct.

In one case attributed to ulceration of the cervix uteri the liver was contracted by "fibroid material."

The situation of the enlargement depends on the part of the liver involved; in the great majority of cases it is on the right side and it seems to pass upward into the chest and downward into the abdomen in about an equal number of cases. Sometimes, when the swelling can scarcely be perceived or even felt—owing to the tension of the muscles—when the patient is lying down, it becomes very evident when he stands or sits up, the epigastrium and the right hypochondrium then bulging out

very markedly; this occurs even when there are close adhesions, as in a case I have recently seen. In the case of very large abscesses the swelling may extend down to the crest of the ilium, as in a case in my own practice, which I have heretofore mentioned, and in a case reported by Hazzard, in which the enlarged liver extended upward to the third rib and downward to four inches below the ribs.

Fluctuation was only mentioned in eight of the cases which I have tabulated; and in very many cases, no doubt, it is absent in consequence of the distance of the abscess from the surface, or obscured by the condition of the abdominal walls or by tympany.

Aspiration is spoken of by most writers on the subject as a certain test of the existence of an hepatic abscess, and in the great majority of cases, certainly, in which it has been tried pus has been withdrawn, if it was present. But there are two conditions, at least, in which pus may be present and aspiration fail to reveal it: (1) The needle may not enter the abscess; (2) the contents of the abscess may be so thick that they cannot flow through the needle; this fact has been previously mentioned in speaking of the contents of hepatic abscesses and need not be dwelt upon now, further than to say that it would seem that the contents of dysenteric abscesses, and it would perhaps be fair to say those due to amœbic dysentery, are sometimes thick at a very early period. In addition to the cases mentioned by Councilman and Lafleur, in which aspiration gave a negative result, Geschwind reports one due to dysentery, which preceded the abscess by only two weeks, in which very little pus was aspirated, though three-fourths of a litre was discharged on incision.

I do not find any record of a failure to get pus when the needle entered the abscess in any except dysenteric cases, unless the abscess was of old date, and its contents had undergone caseous degeneration.

The *complications* of hepatic abscess are quite numerous, but with the exception of dysentery, localized peritonitis and consequent adhesions, and those connected with the pleura and lungs, they are rare.

The *dysentery*, which is such a frequent complication of the amœbic abscesses, has already been described very fully by Dr. Councilman, and I shall not refer to it.

Nor is it necessary to say much with respect to *peritonitis*. We have already seen that in quite a considerable proportion of cases this complication exists, but in the great majority of cases it is localized and adhesive, and so far from being a harmful matter, it is clearly beneficial when there are adhesions to the abdominal wall, because it removes to a great extent the dangers of an escape of pus into the abdominal cavity, when the abscess is incised. In the same way, also, adhesions to the hollow viscera lessen the gravity of a case in which pus is discharged into the alimentary canal.

Occasionally, however, a *generalized peritonitis* is found, which is not due to the rupture of the abscess into the abdominal cavity. Thus in a case reported by Ridlon,¹ due to ulceration of bowel, there was a generalized chronic peritonitis, and the abdomen contained sixty ounces of fluid; and Hazzard² reports two similar cases, one due to dysentery, the cause in the other being unknown.

Hemorrhage from the bowels, or rather hemorrhage *into* the bowels from the cavity of the abscess, is a very rare and very dangerous complication apparently—that is, if any amount of blood is discharged; in many cases, where the abscess bursts into the colon, there is a slight discharge of blood along with the pus, but this slight hemorrhage is only incidental to the rupture, and is not worth calling a complication.

Pleurisy is one of the most common of the complications of hepatic abscess; its occurrence was noted in 11 of the 108 cases. In most cases the exudate was purulent in character, and was then usually due to the rupture of the abscess into the pleural sac, but in some cases the exudate was serous; cases of this kind are reported by Hazzard,³ Feron and Constan,⁴ and Arnaud.⁵

Pneumonia is also an exceedingly common complication, as is apparent from the frequency with which hepatic abscesses burst into a bronchus; in all such cases there is a pneumonia of greater or less extent, but it does not seem to add to the gravity of the case, as a rule; on the contrary, recoveries after rupture into a bronchus are more frequent than after ruptures in any other direction.

Infarction of the spleen is rarely mentioned as a complication of hepatic abscess, and it is of little practical significance at any rate.

Meningitis is also a rare complication, so far as I can determine from the reports which I have examined; it is not mentioned in any of the 108 cases which I have analyzed, though in one of them there was an abscess of the brain. Perhaps meningitis may have been a more common complication formerly, when injuries of the head were said to be a common cause of hepatic abscess.

Caries of the ribs has been noted in several cases. Thus Chauvel⁶ reports two cases of this kind, and Byrd has recorded⁷ a case of unknown origin in which there was "necrosis of the ribs." The abscess had lasted about nine weeks when this was detected; it was very large, and there was œdema and redness of the skin over an extensive area. A very remarkable case has been reported by Hatch,⁸ in which the

¹ New York Med. Journ., April, 1880.

² Med. and Surg. Reporter, Jan. 21, 1882.

³ Loc. cit.

⁴ Gazette hebdomadaire de Sci. Méd. de Bordeaux, March 6, 1889.

⁵ Loc. cit.

⁶ Gazette des Hôpitaux, 1890, p. 91.

⁷ New York Med. Journ., July, 1878.

⁸ Lancet, January 5, 1889.

whole side sloughed away, and not only the carious ribs, but the kidney was also exposed.

An hepatic abscess may terminate in several different ways:

Absorption is said by some writers on the subject to be of occasional occurrence, but I can find no case of the kind recorded which is at all conclusive. In fact, the term "absorption" has been used sometimes, not to signify the complete disappearance of the pus, but to include its cheesy and calcareous degeneration as well. Thus Frerichs says that in most cases where absorption occurs, a cheesy or calcareous remnant remains. Now this is clearly not absorption in the proper sense of the word, and it does not seem to me proper to include those cases under this heading.

Bursting of the abscess is of comparatively common occurrence. Its actual frequency cannot readily be determined, especially since the propriety of early incision has been recognized, but the statistics of Waring will throw some light on this point. Of the 300 cases analyzed by him, 78 opened spontaneously, 48 were opened artificially, 169 died before bursting or incision, and in 5 the result in this respect was doubtful.

Of the 108 cases which I have analyzed, rupture occurred in 18, 26 died before rupture, and aspiration or incision was done in 59 cases; in 5 there is no distinct record on this point. In addition to the 26 cases in which death occurred before rupture, there were 2 in which one abscess had been incised and drained, but at the autopsy another abscess was found which had not been opened. One patient had abscesses four different times, two of which burst, and two were incised and drained. Another had three different attacks; in the first the abscess broke, the second was incised and drained, and the third was incised, but peritonitis came on and caused death. The interval between the first and second abscess was twenty months, that between the second and third five months. The *direction of the rupture* in the eighteen cases was as follows: Into a bronchus seven times, into the pleura four times, into the colon three times, into the stomach twice, into the abdominal cavity three times, outward through the abdominal walls once, and into the pericardium once. In one case rupture occurred into both the bowels and a bronchus, and in another it occurred into the lungs and peritoneal cavity; in yet another into both the pleural cavity and a bronchus. All the four cases in which the abscess broke into a bronchus only, ended in recovery, and recovery ensued also in the cases in which rupture occurred into a bronchus, and the pleural cavity and a bronchus and the bowel, respectively. Three of the four cases in which rupture occurred into the pleura terminated fatally; in the only one having a favorable termination there was an opening into the bronchus also. Of two cases in which the abscess opened into the bowel only, both died; the third, which opened into a bronchus also, ended in recovery. Both

the cases which opened into the stomach terminated fatally, and all three of those which opened into the abdominal cavity had a similar ending, as would have reasonably been supposed. It will be remembered, however, in this connection, that in one case in which pus escaped into the abdominal cavity when the abscess was opened, recovery ensued.

These cases are too few in number to justify very positive conclusions as to the frequency and gravity of rupture of an hepatic abscess in different directions, but I think one conclusion is fully justified, namely, that rupture into a bronchus, or, as it is often called, rupture into the lung, is the most common and least dangerous direction in which such rupture may occur.

Caseation and calcification of its contents are very rare terminations of an hepatic abscess, and are not mentioned in any of the 108 cases which I have analyzed.

Death is a direct result of hepatic abscess, in a large proportion of the cases. Of the 108 cases in my table, 67 terminated fatally—of this number 21 had been either aspirated or incised or drained. 43 cases terminated in recovery, and of these 38 had been either aspirated or incised. The result in three cases is not stated. It will be observed that the total number of *patients* is 108, but the total number of abscesses is 110. This result is due to the fact, previously mentioned, that one patient had three separate and distinct attacks, and another had four. There were two cases, however, in which the result is not stated. Of the 69 fatal cases, the abscesses were multiple in 39 cases, single in 24, and in 4 the number is not stated. If we compare these figures with the general proportion of multiple to single abscesses—42 of the former to 55 of the latter—it is evident that the mortality is much greater in the case of multiple than of single abscesses.

The causes of death are—(1) exhaustion; (2) septic poisoning; (3) peritonitis; (4) destruction of a large amount of hepatic tissue; (5) complications of various kinds other than peritonitis.

It is impossible to get any accurate information as to the relative frequency of the different causes of a fatal termination, because the actual cause of death is so rarely mentioned; but, so far as I can learn, exhaustion is the most serious source of danger, and a slow septicæmia—which, indeed, ultimately causes exhaustion—is next in frequency.

Whatever may be the relative frequency of these different causes of death, however, one thing is quite certain: that, as a general rule, to which there are few exceptions, the longer the abscess remains without a free opening, so that its contents can be easily discharged, the greater is the danger.

The *duration* of the fatal cases was from a few days to six months—the majority died in from six weeks to three months.

The following table will show the mortality of abscesses from various

causes ; it will be observed that I do not include all the 110 cases in the table ; those which are omitted were due to various causes, such as gastric and duodenal ulcer, peri-uterine inflammation, etc., but the cases attributable to any one cause are so few in number that no deductions can be drawn from them.

		Fatal cases.	Mortality.
Whole number of cases	110	67	60 per cent.
Cases due to dysentery	31	20	62 "
" " injury	12	10	83 "
" " gall-stones	8	8	100 "
Causes unknown	38	17	45 "

The other circumstances influencing the prognosis of hepatic abscess have already been considered as fully as time will permit.

The *treatment* sanctioned by results is so distinctly surgical in character that only a brief outline of it will be given here.

It is scarcely necessary to mention temperance in matters of diet and drink, a pure water-supply, and probably, also, the aseptic management of wounds, as prophylactic measures. I shall not consider the influence of the treatment of dysentery on the occurrence of hepatic abscess, because it has already been considered in the papers on dysentery.

It is very questionable whether any drugs are useful in cases of hepatic abscess, except in so far as they relieve symptoms and aid in the maintenance of the patient's strength.

In view of the extreme difficulty, or, indeed, the impossibility, of determining in a given case whether there is but one abscess or more than one, and in view, further, of the results of operative treatment as compared with expectancy, surgical measures would seem to be indicated in all cases as soon as it is certain that pus has formed, unless the abscess has opened in such a situation that it can discharge freely, and unless the absence of fever, and a general improvement in the patient's condition, give reasonable ground for hope that danger has passed.

In cases of multiple small abscesses, surgical treatment would do no good, but it would as certainly, I think, do no harm ; and as it is impossible, as just stated, to recognize the existence of multiple small abscesses by any special symptoms, it seems to me the patient should have the benefit of the doubt, and an attempt at least should be made to find the pus with the aspirator.

Of course, extreme exhaustion would contra-indicate operation here, as in other surgical cases.

The last point to be considered, then, is the different operative measures which have been proposed and their relative value.

The methods which have been proposed and practised are :

1. Aspiration alone.

2. Aspiration and subsequent washing out of the cavity with some antiseptic solution through the aspirator-needle.

3. The use of a large trocar and canula alone.

4. The use of a large trocar and canula, the canula being subsequently left in to secure drainage.

5. Incision.

6. Incision and drainage.

7. Incision and washing out with some antiseptic solution with or without subsequent drainage. But practically these seven may be reduced to three, namely: 1. Aspiration. 2. Incision and drainage.

3. The use of antiseptic washes.

I shall have nothing to say as to the use of Vienna paste before the incision to insure adhesion between the liver and abdominal walls, or of the use of acupuncture for the same purpose, or of stitching of the liver to the walls, etc. These are distinctly surgical measures and do not properly belong in this paper.

Aspiration was practised in 17 of the cases which I have analyzed. Of these 17 cases, 7 ended in recovery, and 10 were fatal. In 4 cases, however, aspiration was followed later on by free incision and drainage, and of these 4, 3 recovered and 1 died. In one of the recoveries, after aspiration the cavity was washed out with carbolic solution through the aspirator-needle.¹

Incision and drainage were practised in 48 cases, and of these 35 ended in recovery, and 13 were fatal. Of the 35 cases which ended in recovery, antiseptic injections were used in 12; and of the 13 cases which ended fatally, antiseptic injections were used in 2. Of the 35 cases which ended in recovery the abscess was attributed to dysentery in 10 cases; to injury in 2, to an ulcer on the leg in 1, and in 22 cases the cause was unknown.

The causes of death were as follows: in 5, the presence of other abscesses; in one of these there was an abscess in the brain also; in another the abscess which was incised had healed. In the cases of single abscess death resulted from exhaustion three times, from peritonitis once, from pneumonia once, from waxy degeneration of the liver and kidneys once, and from persistent diarrhoea once. In only one case, that of peritonitis, could the result have been due to the operation.

The value of prompt incision and drainage is perhaps universally recognized now, but I trust the statistics which I have given, dry as they are, may not be without value.

¹ Aspiration is *very rarely* dangerous, but it is not absolutely free from danger. Dr. J. C. Reeve, of Dayton, Ohio, has reported a case in which death occurred as the needle was being introduced, and Dr. Godlee refers to the danger of internal hemorrhage from the needle puncture.

I would refer again, in conclusion, to the statistics on this point of Ferron to which I have previously alluded. In 47 cases of antiseptic hepatotomy for hepatic abscess which he collected, there were 10 deaths which were caused as follows: 5 were due to multiple abscesses, 1 to pulmonary trouble, 3 to complications, and 1 to peritonitis, brought on by a counter-opening fifteen days after operation.

In 39 cases of single abscess, he says death followed antiseptic hepatotomy only once.

Of the 8 cases of multiple abscesses, 5 terminated fatally.

Of the 13 fatal cases there was but one abscess in 7; there were more than one in 5, and in 1 the number is not stated.

The following conclusions, it seems to me, are either warranted or rendered highly probable:

1. That hepatic abscesses rarely occur as a result of injuries or diseases of the bones or other parts of the body, except those directly connected with the portal system of veins, or immediately adjacent to the liver.

2. Ulceration of the bowels is a common cause of hepatic abscess, but neither the morbid changes nor the symptoms are those of simple dysentery. It is probable that in most cases, at least, when the hepatic abscess is due to dysentery the latter disease is amœbic in character.

3. An hepatic abscess may appear in two weeks from the commencement of the dysenteric attack, but the usual time is from four to twelve weeks. It is impossible to say how long a time must elapse after an attack of dysentery before all danger of hepatic abscess is past.

4. Abscesses originating in the bile-ducts and those due to injuries of the liver itself seem to be of comparatively rare occurrence. When due to injury, the abscess usually appears in a few days.

5. Abscesses occurring in connection with general septicæmia or pyæmia are probably nearly always multiple in number and small in size, but in rather more than half of all other cases the abscess is single and comparatively large. Abscesses due to gall-stones, however, are usually multiple.

6. Aspiration occasionally fails to reveal an hepatic abscess, because the needle may not enter it, or the contents of the abscess may be too thick to flow through the needle.

7. There are no means of determining with certainty the presence or absence of adhesions in a given case; pain, tenderness, and œdema over the seat of the liver suggest the presence of adhesions, but are by no means certain proof of their existence. Even the up-and-down movement during respiration of a needle inserted into the liver is not a conclusive proof that adhesions do not exist, as was shown by a case recently under my care.

8. Of the symptoms and signs of hepatic abscess, pain, tenderness,

and swelling in the hepatic region are by far the most important. Fever is present in a large proportion of cases, is intermittent in character, and except in pyæmic cases rarely rises above 102.5° or 103° . Jaundice and ascites nearly always denote the presence of dense adhesions or gall-stones. Dyspnoea and cough are frequently present.

9. It is doubtful whether absorption of the contents of an hepatic abscess ever occurs; bursting is of frequent occurrence, the most usual direction being into a bronchus or the pleural cavity. Under expectant treatment death occurs in a large proportion of cases before bursting.

10. With respect to treatment, free incision and drainage give far better results than any other mode. The results of aspiration are rarely satisfactory, nor is aspiration itself entirely free from danger.

SEROUS CYSTS IN THE CEREBELLUM.

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Cysts of various kinds are met with in the cerebellum. Thus, there are hydatid cysts, cysts due to the *cysticercus cellulosæ*, cysts following hemorrhage or softening, cystic tumors, and also a very rare variety of cysts—the so-called simple or serous cysts. A number of cases have been recorded in which post-mortem examination has revealed a cyst in the cerebellum containing clear fluid, and as no evidences of the first five above-mentioned causes have been detected, the cases have been described as simple or serous cysts of the cerebellum of obscure origin.

Gowers and Bastian mention these so-called simple or serous cysts; and cases have been recorded by Sharkey, Hadden, Habershon, and others. All writers on the subject have had great difficulty in explaining the origin of these cysts.

Of course, a cerebellar cyst can only be classed as a simple or serous cyst when the history and pathological examination have failed to reveal any evidence of hydatid, *cysticercus cellulosæ*, hemorrhage or hæmatoidin crystals, or tumor growth. The object of the present communication is to draw attention to the very great difficulty, if not impossibility, of excluding tumor as a cause of apparently simple cerebellar cysts.

Until a most careful and *minute microscopical examination of every part of the cyst-wall* has been made, one is not justified in excluding tumor and describing the case as one of simple cyst. I have recently met with two cases which seem worthy of brief record from their bearing on this point. In both cases, after careful dissection and fairly complete

microscopical examination, I could detect no evidence of tumor, and looked upon them as cases of simple or serous cysts. But on further examination, though nearly the whole of the cyst-wall presented no evidence of tumor, yet at last a very small patch of new-growth was detected. How small this patch of new-growth may be, the notes on Case I. will show. In this case, nowhere, except at one spot in the cyst-wall, was any evidence of new-growth detected; and the new-growth was a minute oval glioma, measuring only $\frac{3}{8}$ of an inch by about $\frac{3}{16}$ of an inch (about 2.5 mm. by 4 mm.), in the wall of a cyst nearly the size of a pigeon's egg. Further, almost the half of this gliomatous new-growth consisted of bloodvessels. If a tumor can undergo cystic degeneration to such an extent that the only remaining new-growth shall be of the dimensions just mentioned, it does not seem improbable that in some cases the whole of the growth may disappear and only a cyst remain.

When one considers the above fact, it is evident that no cerebellar cyst can be described as a simple serous cyst until portions from *every part* of the cyst-wall have been carefully examined microscopically. It seems probable that in some of the recorded cases of simple cysts a minute portion of tumor-growth has escaped observation; and in the other cases, supposing no minute patch of new-growth has been undetected, it seems not improbable that the cases have been cystic tumors in which the cystic degeneration has been so extensive that the whole of the growth has disappeared. On looking over the clinical history of these cases of so called simple cyst we find that the symptoms have been those of cerebellar tumor—severe headache, vomiting, marked optic neuritis, staggering, etc.—and have increased until the death of the patient.

While not denying the possibility of the origin in other ways, it seems more probable that so-called simple or serous cysts have been cystic tumors in which the cystic degeneration has been so marked that the whole of the tumor-growth has disappeared, or only so minute a portion has remained that it has escaped detection.

Briefly, then, the reasons for this assumption are the following:

1. The history and symptoms have been those of cerebellar tumor.
2. Intra-cranial tumors are especially liable to undergo cystic degeneration when situated in the cerebellum.
3. So-called simple serous cysts are exceedingly rare.
4. In many cases which have been looked upon as simple cysts minute examination has revealed a very small mass of tumor-growth at some part of the wall.
5. Hence, no case can be classed as a simple cyst unless careful examination of portions from *every part* of the cyst-wall has revealed no tumor-growth.
6. The amount of new-growth may be so minute as to measure only

$\frac{3}{32}$ by $\frac{3}{16}$ of an inch in the wall of a cyst nearly the size of a pigeon's egg (and almost half of this portion may consist of bloodvessels).

7. If the cystic degeneration can be so marked that only a patch of new-growth of the above dimensions is left, it seems not improbable that in some cases the whole of the tumor may disappear and only a cyst remain, or the remaining tumor-growth will be so small as to escape detection.

To the writer the above seems the explanation of the cases in which the cysts are found *only* in the cerebellum. The origin, however, of those exceedingly rare cases of multiple cysts occurring in the cerebrum, cerebellum, and abdominal organs is very obscure. The following are brief abstracts of the notes of the two cases above mentioned. (For the opportunity of observing the cases during life and of making the pathological examination I am indebted to the late Dr. Ross and to Dr. Bury.)

CASE I.—G. B., aged twenty-seven years; admitted as an in-patient at the Manchester Infirmary, January 20, 1891, under the care of Dr. Ross.

Previous history: Fourteen months before admission the patient was first troubled with headache. This was mainly frontal and at the vertex. It gradually increased in severity, and was worse at night. Six weeks before admission his sight began to fail; three weeks before admission he became blind. A staggering gait and tendency to fall (?) forward had been noticed for two weeks before he came to the hospital. He had been troubled with vomiting occasionally during his illness. No syphilitic history. Nothing of importance with respect to previous health and family history.

Present state: Patient badly nourished; complains of frontal headache and loss of sight. He is quite unable to stand; staggers whenever he attempts to do so; ataxia is so marked that it is impossible to say in what direction he tends to fall. When in bed he can perform, though feebly, all the movements of his limbs; no rigidity; knee-jerks and plantar reflexes present; no ankle clonus. No paralysis of facial, ocular, or tongue muscles nor of muscles supplied by the motor branch of the fifth nerve. No anæsthesia or analgesia. Patient is unable to distinguish light and shade; pupils dilated; marked double optic neuritis, with many retinal hemorrhages. Nothing of importance was detected on examination of the other cranial nerves and other organs of the body. The pain in the head became worse. The patient passed into a semi-conscious condition; otherwise the symptoms were much the same until his death, about four months after admission. The post-mortem was made by Mr. Taylor, M.A., who kindly gave me the cerebellum and the following notes:

Autopsy.—Permission was obtained for examination of the head only. The membranes of the brain were normal. The floor of the third ventricle formed a cyst-like dilatation just behind the optic chiasma. On section, the third and lateral ventricles were greatly distended with clear fluid. Beyond the results of the distended ventricles nothing abnormal was detected on the examination of the cerebrum. At the lower part of the right lobe of the cerebellum was a large cyst only

separated by a thin layer of nerve tissue from the surface. The cyst contained a clear, straw-colored fluid loaded with albumin. No hydatid hooklets nor scolices detected. No signs of hemorrhage. No evidence of cysticercus. No pus cells, no hæmatoidin crystals.

The cerebellum, pons, and medulla were placed in spirit, and given to me for examination. In the right lobe of the cerebellum was a large oval cavity nearly the size of a pigeon's egg, about $1\frac{1}{2}$ inches in the antero-posterior diameter, by about $1\frac{1}{4}$ inches in the transverse diameter. It was only separated from the inferior cerebellar surface by a very thin layer of nerve tissue. The interior of this cavity was quite smooth, and its wall appeared to be composed of condensed nerve substance. No *distinct and separate cyst wall* could be detected. At the median side of the superior surface of the cavity was a longitudinal depression running in the antero-posterior direction. At the posterior end of the cyst a small portion of the wall, about the size of a pea, had been removed for examination by Mr. Taylor. Most careful examination of the cyst wall at the spot from which Mr. Taylor had removed the small fragment, and an examination of portions of the cyst wall from all other parts, failed to reveal any evidence of tumor, and I concluded that the case must be one of simple serous cyst. On mentioning the fact to Mr. Taylor he informed me that, at the spot from which he had removed a small piece of the cyst wall, there was a very slight elevation—the slightest sessile projection, on naked-eye examination. He shortly afterward sent me a section of this slight elevation. Microscopical examination showed a very minute patch of tumor growth, the dimensions of which were $\frac{3}{8}$ of an inch by $\frac{3}{15}$ inch. This patch was surrounded by normal cerebellar tissue. The new growth was a very vascular glioma; nearly one-half of this minute mass being composed of dilated blood-vessels. Several small cysts were also present in this minute nodule. On microscopical examination the wall of the cyst appeared to be formed simply of condensed cerebellar tissue; there was no separate cyst wall. Nothing abnormal was detected in the pons and medulla.

CASE II.—Ellen Mc., aged forty-seven years, admitted as an in-patient at the Manchester Infirmary, under the care of Dr. Bury, September 22, 1891.

Previous history: Patient had been troubled with headache and vomiting more or less for two years previous to admission. In February, 1891, symptoms became much worse, and she began to be troubled with a buzzing in the head like the "rushing of water." After a week's rest in bed she improved; but soon began to suffer from attacks of giddiness. For five months previous to admission there had been marked unsteadiness in walking; vomiting had been very troublesome. Several times she had fallen down, owing to vertigo, and at these times the noises in the head had been louder. Patient had been deaf in the right ear since childhood (middle ear disease following measles); for twenty years no discharge from meatus. Deafness had increased very much during last two months. No history of syphilis and no other points of importance in previous history.

State on admission, September 23, 1891: Patient complains of severe headache (especially in the occiput); of deafness and noises in the ears, like the rushing of water; also, of unsteadiness in walking, and vomiting. She is just able to walk without assistance, but only for a short distance. She is very unsteady, and has a tendency to fall backward.

There is no paralysis of the facial, ocular, or tongue muscles. She can perform all the movements of the limbs. The knee-jerks are present; no ankle clonus; no anæsthesia.

Pupils equal, react to light and to accommodation. Vision, R. 6/xxiv, L. 6/xviii.

Ophthalmoscopic examination: Slight optic neuritis both eyes. Margins of both discs slightly blurred; discs slightly swollen and of a grayish-red color; vessels tortuous. Changes more marked in right eye.

Patient is troubled with noises "like the rushing of water" in both ears. No discharge from the ears; considerable deafness. Watch heard at distance of four inches on the left side; not heard in contact with right ear, but heard on contact with the skull above the zygoma. A tuning-fork placed on the vertex is better heard in the right ear than in the left. Examination with the ear speculum: Right tympanic membrane completely destroyed; but the meatus and tympanic cavity quite dry and free from pus. Left membrane retracted. The patient is very dull and stupid. Heart, lungs, and urine present no important abnormalities. There is frequent nausea, retching, and vomiting; breath very offensive.

28th. Severe headache. Pain at the occiput and at the back of the neck; at times very intense. It was necessary to discontinue the examination of the patient on several occasions, on account of these paroxysms of pain. When the patient shows her teeth, the naso-labial fold is not so well marked on the right side of the face as on the left.

The optic neuritis has become more marked. There is a small hemorrhage below and to the outer side of the right optic disc. Vomiting not so frequent. Since admission the temperature has been between 97° and 98°, except on one occasion, when it rose to 98.4°. Patient fell asleep in the evening, but was found dead in bed at 4 A.M., next morning.

Autopsy (Abstract).—No changes of importance were met with in any of the organs of the thorax or abdomen. Skull-cap and dura mater normal. On removing the brain a thin, translucent membrane, evidently the lower wall of a cyst, was seen at the inferior surface of the right lobe of the cerebellum. On cutting into this membrane it was found that the right lobe of the cerebellum was occupied by a large cyst containing clear straw-colored fluid. The inferior wall of the cyst bulged, and anteriorly came almost in contact with the right facial and auditory nerves (brain lying after removal with base upwards). During life it is very probable that the cyst did press on these nerves.

No evidence of tumor growth could be seen, and the cerebellum was placed in Müller's fluid for further examination. In the contents of the cyst there were no hydatid hooklets, blood-corpuscles, pus cells, or hæmatoidin crystals; also, there was no evidence of cysticercus cellulose. The fluid contained a large amount of albumin. The rest of the brain was normal. Base of skull normal. There were no cysts in any other part of the body.

After hardening in Müller's fluid the cerebellum was dissected. The cyst cavity was about the size of a walnut; it was roughly oval in shape, the long axis being in the antero-posterior direction. The wall of the cavity was smooth, except anteriorly, where there were a few slight irregularities. There was no separate cyst wall, the cavity appearing

to be bounded only by condensed cerebellar tissue (as was afterwards confirmed by microscopical examination). Near the posterior part of the superior wall (roof) of the cavity was a small opening a little larger than a pin's-head. This was seen to lead into a second small, flattened, smooth-walled cavity, just above (superior to) the one described.

To the naked eye no evidence of tumor could be detected at any part of the cyst wall, and the cyst appeared to be a simple serous one.

Careful microscopical examination of portions taken from various parts of the cyst wall appeared to confirm this opinion. But after prolonged search a small nodule of cystic glio-sarcoma, about the size of a pea, was found at the anterior end of the cyst wall. The nodule was $\frac{4}{16}$ of an inch in diameter (6 mm).

As above mentioned, cases of cerebellar tumor, cystic tumors, and so-called serous cysts present the same symptoms during life, and hence differential diagnosis is impossible.

In the case of a cerebellar cyst, in the wall of which there is either no new growth or only a small fragment, it is possible that if the cyst could be punctured and drained like an abscess, temporary or permanent benefit might follow. A small nodule of glioma in the wall might shrivel up after the cyst was drained.

A case is recorded in the *Berliner klinische Wochenschrift* (July 28, 1890), by Oppenheim and Koehler, of paralysis of the left side of the face and total paralysis of the left arm, with diminution of sensibility. There was a history of Jacksonian epileptic attacks preceding the paralysis, which had come on gradually. An operation was performed, and a cystic cerebral tumor (glioma) was found in the right motor area of the cortex. The contents of the cyst (clear yellowish fluid) were evacuated and only the superficial part of the growth removed, and the cavity drained. Rapid improvement occurred. The movements of the left arm became almost normal, and the patient was discharged from the hospital, well, three months after the operation.

As above mentioned, cystic degeneration is much more frequent in cerebellar tumors than in tumors at other parts of the brain. Hence, in a given number of cases, presenting during life symptoms of cerebellar tumor, the lesion in a considerable number—though, of course, in a minority—will be of a cystic nature; either a cystic tumor or a cyst, in the walls of which only a small fragment of tumor or no new-growth whatever is present.

Hitherto operations for the removal of cerebellar tumors have been extremely unsuccessful. It is worth considering, however, whether it might not be justifiable, in some cases presenting symptoms of cerebellar tumor, to trephine the skull, and puncture the cerebellum with a fine hypodermic needle, in the hope that the lesion is one of the cystic conditions just mentioned; and if fluid were obtained, to drain and treat as an abscess. This, of course, could only be thought of—after the

failure of medical treatment—in cases the history and symptoms of which rendered a tubercular or syphilitic tumor improbable, preferably in cases in which there was some indication of the side affected. It would only be in the cases of cyst, cystic glioma, and glio-sarcoma (cystic sarcoma?), that there would be any probability of success. But as trephining and puncture with a fine hypodermatic exploring needle (under strict antiseptic precautions) would not be a very formidable procedure, and as the cases are otherwise hopeless, it does not seem very objectionable. In the majority of cases the growth would be solid; but with strict antisepsis probably no grave results would follow. In a minority of cases, however, *the lesion would be cystic* (one of the forms above mentioned); if such were found to be the case, drainage, as in Oppenheim and Koehler's patient, might be followed by good results. The prospects of success, of course, are slender; but, as otherwise the cases are hopeless, the above appears to be a point worthy of attention, when one remembers that lesions of a cystic nature have been found in the cerebellum in a considerable number of cases. The rare cases in the cyst wall of which there happened to be only a small fragment of tumor growth, or no new-growth whatever, would be most hopeful.

THE TREATMENT OF ACUTE DYSENTERY BY ANTISEPTIC RECTAL AND COLON IRRIGATION.¹

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THE history of the rectal treatment of dysentery is a very interesting one, but I must resist the temptation to enter upon it. It dates back to the Egyptians, Greeks, and Romans, and had alternations of a century of favor followed by centuries of disfavor and abuse. The ancients employed it for the removal of "acid humors," which, they thought, by their retention intensified the inflammation, and to this same idea have we come again with the help of fifty years of microscopic and chemical study. Coming down to recent years there is one period in the history of this treatment to which I must refer.

IRRIGATION WITH COLD AND WARM WATER.—It is a matter of some interest to us, that a physician of the neighboring and historic town of Bladensburg was the first to recommend cold-water injection in dysentery. In the *Edinburgh Journal of Medicine*, in 1826, Dr. Joseph Kent, of Bladensburg, wrote that since 1823, he had employed ice-water injections for dysentery at half-hour intervals, "speedily

¹ Read before the Association of American Physicians at Washington, May, 1892.

alleviating every distressing symptom." In 1848 Assistant-Surgeon Withecomb, in a Calcutta medical journal,¹ reported two cases successfully treated by high injections with a long tube. But it is to the published opinions of Drs. O'Beirne and Hare, that special attention should be paid. O'Beirne, in an article on "New Views of the Process of Defæcation" (Am. ed., Washington, 1834, p. 35), held that in dysentery, "the chief curative indication should be to pass up the gum-elastic tube and introduce it into the sigmoid flexure, in order to give exit to the accumulated and pent-up contents of the cœcum and colon." In an appendix he writes: "Dysentery having reappeared in this city (Washington), I have had opportunities of trying my novel mode of treating the disease." One to four pints of warm water with castor or olive oil were thrown in: hardened feces, mucus, and flatus were passed, with relief of the symptoms.

Hare² used these words, full of meaning to us now: "The substance of the whole argument is this—the long tube changes a huge internal abscess into an external one, and enables us to wash out and cleanse from it its putrid contents. It also enables us to foment and soothe by local applications the sloughing and ulceration these contents have caused on its surface. . . . Dysentery in its primary nature . . . is a mild and harmless disease, and . . . therefore if we remove quickly these acrid secretions we shall disarm dysentery of its terrors." He advises the physician not to cease repeating the injection until he is satisfied that the colon is evacuated and cleansed; it is as necessary to wash out the colon when its contents are liquid as when they are solid. "By passing an elastic tube beyond the sigmoid," he says, "I have found in more than three hundred cases of the severest form of dysentery not the slightest difficulty in washing out the colon from cœcum to anus. . . . In treating three hundred and forty-six cases in Calcutta, I had but 4½ per cent. of deaths."

It is a matter of some little pride to us that two of the three or four who first demonstrated the value of this mode of treatment should have been so near to us—the one our near neighbor, employing iced-water injections, and the other a surgeon of the army residing in Washington, advocating and using irrigations with large quantities of warm water thrown into the sigmoid flexure, with a view of cleansing and washing out the bowel.³

¹ India Reg. Med. Sci., Calcutta, 1848.

² Edinb. Med. and Surg. Journ., vol. lxxxii., 1849, p. 40.

³ Cold-water injections or irrigation have also been advised by Baker (1825), Dulles (1877), Messemmer (1878), Dagand (1879), Laporte (1879), and Simon (1886).

Warm or hot water has been advised and used by Irving (1849), King (1872), Reid (1876), Kingsley (1887), Graham (1887), and Fordyce (1886). By some of these writers water irrigation was used as a preliminary step to the injection of drugs in solution.

· ANTISEPTIC IRRIGATION.—As far back as 1774, we have records of efforts to modify the putrescence and gangrenous destruction of tissue by antiseptic injections.¹ Peruvian bark, chamomile flowers, calumba, charcoal, chloride of lime, hyposulphite of soda, creasote, and other substances have been employed for the purpose by various physicians from that date until the introduction of the more successful antiseptics of the present day. In 1879 Cantani,² after treating of rectal alimentation, speaks of disinfecting the colon in dysentery and other diseases by such drugs as carbolic acid, salicylate of soda, borate of soda, etc., and predicts a great future for this kind of treatment.

Two causes have coöperated to draw renewed attention to rectal and colon antisepsis; one is the growing belief in the specific and contagious nature, with the recent discovery of the amœba, of dysentery; the other is the dissatisfaction with other methods and the effort to find in this disease a direct, rational, and successful treatment.

I will not refer to all that has been written on this subject, but for three or four years past the journals have contained some favorable reports of this method. It will be noted, however, that few of them refer to *irrigation*; injection is the usual plan.

The latest communication is one that I have had translated since this paper was written. It is by Dr. Korytin,³ a Russian. He refers to Dr. Strhogloo⁴ as having published, five years before, the results of his treatment of washing out the bowel with a 5 per cent. solution of carbolic acid. Sixteen cases are reported with excellent results. Dr. Kamper in the same year reported the same method used in eighteen cases. Korytin employed warm water or warm carbolized water. One tube only was used and the fluid (six pounds) was allowed to remain in the intestine five to ten minutes, even fifteen to twenty minutes. One to three washings were generally sufficient; sometimes four to six were given, never more than one daily. Nine of the cases were severe (diphtheritic); six were milder (catarrhal). The improvements noted after the injections were: the number of the stools diminished; the frequent desire lessened; appetite, sleep, and the nervous state were all improved. The feces became thicker, lost their foul smell, and the mucus, blood, and particles of waste tissue disappeared; the fever subsided. In the mild forms the results were happiest. In them tepid water had as good an effect as the carbolized warm water. The history of each case is given in detail, showing that the improvement followed immediately upon the washing of the rectum, and that relapses due to its suspension were arrested at once by a return to the treatment.

¹ Pringle: Obs. on the Diseases of the Army, 7th ed., London, 1774, p. 275.

² Presse Méd. Belge, Brux., 1879, xxxi. 275.

³ Vrach, 1890, xi. 957.

⁴ Russkaia Meditsina, 1884.

In one fatal case after irrigation, the stools were from twenty to five daily; tormina and tenesmus lessened, but the patient grew weaker and died; gangrenous lesions in the bowel were found. In many of the cases internal medication was tried, proved ineffectual, and recourse was then had to the washing. The duration of the case after beginning the treatment was three, and in the most severe cases, seven days.

The strong arguments for the superior advantages of antiseptic irrigation are found in the complete and successful manner in which it answers to the pathological conditions of dysentery: an intense inflammation, seated in the rectum, sigmoid flexure, and colon, and always more intense here, even when the disease extends higher up, characterized by gangrenous destruction of tissues and ulceration with decomposition, and accompanied and most probably due to bacterial multiplication. If these conditions existed *outside* the body there would be but one course followed; the removal of the cause, if possible, then cleanliness and thorough antisepsis. Within the intestinal canal the typical treatment would be the removal of the cause or contributing cause, and cleanliness by thorough flushing of the bowel and antisepsis. There can be, there *must* be but this one principle of treatment, and if the mechanical difficulties involved are removable, it must be the *successful* treatment.

There is one feature in dysentery to which I wish to draw separate attention. It is this: The rectum and colon form a distensible cavity and are closed below by the sphincter. In dysentery this cavity, especially its sacular and most dilated lower portion, becomes the most distended, the most filled by the contents, which are composed of transuded serum, blood, decomposing shreds of tissue, and the results of digestion, the whole being in an active state of disintegration and filled with multiplying bacteria. The sphincter as a result of neighboring inflammation and œdema, acquires great irritability, dilates frequently, but with irregular and spasmodic movement, and contracts quickly and violently, closing the orifice before the rectum is completely emptied. Thus the rectum becomes like an acutely inflamed bladder. A certain quantity of its contents is expelled; a residuum is always left; in some cases the amount is small, in others—bad cases with much fluid—it is large. The rectum is never emptied, but always contains some fluid in a state of active decomposition. In this condition, as in a distended bladder full of decomposing urine, the first indication is to empty the rectum, and the second to wash out the cavity and to keep it empty and clean.

If this statement which I make is true, it has a most important bearing on the nature of dysenteric symptoms and on the kind of treatment which they require. I have found no reference to the fact in any work on medicine or in any medical contribution on the subject, although, in the enormous mass of literature on dysentery, the failure to find such a reference might well be excused. That it is a fact, I have demonstrated

in several cases to my own complete satisfaction, and although it may not be an essential feature in all cases, yet in a large number and those the most severe, it is a constant condition.

The patient whom we see straining at intervals of a few minutes in his violent efforts to empty the rectum, does not empty it, the very intensity of the muscular contraction defeating this object. The sphincter shares in the irritability of all the rectal muscles, and closing spasmodically shuts off the escape of the contents before the act is accomplished. The result is also in part brought about by the patient lying down while straining, and the more feeble from prolonged illness he is, the more likely is the rectum to be incompletely voided. Moreover, the routine treatment in dysentery helps to aggravate this retention; opium suppositories paralyze expulsive muscles but do not relax the sphincter; the number of actions is lessened and they are smaller, but the dangers are increased in proportion to the apparent success of the treatment, and the more severe the case and the more energetic the treatment, the greater is the danger. In graver forms we have the more abundant, dirty white purulent and fetid stools, and the reddish-brown fluid with floating shreds of diphtheritic dysentery. The abundance of fluid favors its retention and accumulation, and every opportunity is given for the absorption of poisonous materials and systemic infection. Under such circumstances can any course seem more unreasonable than the ordinary treatment adopted, and can any course be reasonable except one which applies general and accepted principles to the peculiar physical conditions of dysentery? *Keep the colon and rectum empty and clean*; that is the law and the whole gospel.

The following are two illustrative cases:

CASE I.—Miss S. was taken ill on the night of May 28th, with an attack of severe abdominal pain and so-called diarrhœa. Purgative was given at intervals then, and on the 29th, 30th, and 31st, the actions becoming more frequent, smaller, and showing blood. I was sent for in the night of the 31st. She was suffering intense pain, and was much exhausted by frequent rising to stool; I gave a hypodermic injection of morphia and stimulants internally, and suppositories of morphia were ordered.

June 1st. Some nausea and vomiting. Two actions, reddish in color and offensive, of thickish fluid about two ounces each time. Stimulants, liquid food, and poultices to the abdomen ordered, and a saline purge as soon as she could take it. By the afternoon she had taken two purgative doses, and had had four stools, the last more fecal in appearance with a small scybala, but containing some blood.

2d. Had a moderately good night; two suppositories used. Three small stools, brownish fluid containing some blood. Champagne, milk, and whiskey during the night. During the day she had three stools of reddish-brown fluid with tenesmus; pain in the rectum and abdominal pain. At night she was worse and more nauseated. The actions were

more frequent, consisting of a small amount of fluid, like uncooked beef-tea, passed with tenesmus and causing vomiting.

3d. The stools occurred every hour, and were of the same character, fluid, offensive, and reddish. The desire to empty the rectum and the burning pain in the anus were constant. She had every indication of being weaker and more ill than before. A soft-rubber tube was passed into the rectum and about two ounces of fluid of the same character as had been passed before, flowed out through the tube. A smaller soft-rubber tube was passed by the side of the escape tube, and the rectum was irrigated with a continued stream of warm water with dissolved boric acid, until the water ran perfectly clear. A suppository of a quarter of a grain of morphine was then introduced.

During the day from this time on there was no action. At 3 P.M. the tube was again passed and about one ounce and a half of fluid of the same character escaped. Irrigation as before, and suppository introduced. At 10.30 P.M. there had been no stool and the patient was much stronger in pulse and manner; had had no nausea, and had taken a good deal of nourishment, chicken broth and milk and brandy. Tube then introduced and escape of fluid as before; irrigation and suppository. During the night she was comfortable, and there was no action until 7 A.M. Two suppositories were used.

4th. There were two irrigations practised during the day with the same result as yesterday. The rectum was first emptied of a small amount of fluid, more brownish than before, then washed out, and a suppository introduced. There was nothing else passed from the rectum all day. The night was comfortable.

5th. A dose of oil was given as there had been no action; this produced six actions during the day, four contained some solid matter and the last two were thin and brownish; there was no blood. No irrigation to-day in consequence of the frequent actions.

6th, and for three days after, the rectum was washed once daily; there was no pain or diarrhoea, and her general condition continued to improve daily.

The two points in this case I would draw attention to are:

First. The fact that the rectum was not emptied voluntarily, although the stools were frequent on June 2d and 3d; and, second, that the complete evacuation of the rectum and the antiseptic irrigation at once relieved the distressing symptoms, both local and reflex; thenceforth the patient had no escape of fluid from the rectum except through the tube—that is, no action of her own assent or volition; the morphia, of course, contributed to relieve the irritability of the rectum and sphincter.

CASE II.—Mrs. Y., an elderly woman, of about sixty-five years of age, who had had a dysenteric attack in 1889, was taken with symptoms of extensive colitis in July, 1890. The chief symptoms were fever; feeble pulse; coated, dry tongue; no abdominal pain; frequent fluid evacuations, two to four ounces each time, of a dark-brown, very offensive fluid, containing small masses and shreds of mucus and a very little blood. She tried to resist the frequent desire, but every half-hour to an hour the anus would open and discharge and then spasmodically close

with pain and burning. I tried for three days to relieve her by giving opiate suppositories combined with liquid food. But she made no change for the better, and finally I succeeded in inducing her to let me try a thorough washing of the rectum. I brought her to the edge of the bed in the position for a dorsal uterine examination, and introduced a small bivalve vaginal speculum into the rectum. This was done gradually, without causing much pain. Several ounces of the same ill-smelling fluid escaped from the rectum when the sphincter was relaxed. The rectum was then thoroughly washed out with a five per cent. solution of carbolic acid. All other treatment was suspended. There was an immediate relief to the tenesmus and to the constant and uncomfortable desire to evacuate the rectum. The bowels were not moved until the following day, the discharge being of the same character but less in quantity and less offensive. From this time the rectum was cleansed twice daily for four days; the voluntary stools ceased, the fluid washed out contained mucus shreds, and without a purgative normal fecal matter was passed after the third day's irrigation.

In this case the situation was continued rectal and colon inflammation with beginning ulceration and retention of the decomposing fluid in a distended rectum, consequently increasing danger of infection. The treatment was followed by immediate good.

I will add no words of argument to these facts, which so clearly show the uselessness, the waste of time in mouth-treatment by drugs, and the rational application of a simple and obvious principle to the relief of a local disease.

METHODS OF IRRIGATION AND ANTISEPSIS OF THE COLON AND RECTUM.—In the earlier methods of rectal and colon treatment, water was thrown into the bowel, retained for a certain time and then expelled. Some of the most excellent results are reported from this plan and within recent date. But this cannot but be an imperfect way of cleansing the bowel, although it answers well enough for bringing an antiseptic fluid in contact with the wall of the bowel and with germ-breeding mucus. The objection to it is, the necessity of distending the inflamed coats of the bowel up to a point where injury may be done, if any considerable quantity of water is injected; its advantage is that by this distention the antiseptic fluid washes the inner wall more thoroughly than without it. The method is better fitted, therefore, for subacute cases or those tending to become chronic, than for the acute inflammation with necrosis of the mucous coat. Properly speaking, this method is not irrigation at all, and the only procedure deserving of this title is that in which there is a *free* and *immediate escape* of the water thrown in; and even without argument, it is apparent that in this way only can the bowel be thoroughly emptied and made aseptic.

The mechanical difficulties are very much greater in the efforts to irrigate the colon than in the case of the rectum. To wash the *rectum*, a double, in-and-out, hard-rubber tube, passed into the rectum five to

eight inches, through which flows a current of water from a fountain syringe, answers the purpose well. The only objection is the pain which attends the introduction of a hard, inflexible instrument through the irritable anus. Two soft-rubber tubes passed side by side, the larger one for the escape current, are more comfortable for the patient and better in every way; No. 17 English (29 French) is a good size for the smaller tube, the escape tube can be two sizes larger. A large-sized soft catheter will do very well for the entering current. The double-current soft-rubber tubes are not so successful; their soft and thin walls are pressed upon by the sphincter and escape of fluid is obstructed. Then again there is an advantage in having two separate tubes, as either can be pushed up or down as it is desired to wash different parts of the rectal wall; they are, therefore, to be preferred to any double-current tube. The disagreeable sensation of distending the anus passes away in a few moments and the patient gets so much relief from the operation that he ceases to object; preliminary cocaine application may be used if the suffering is great.

All that is needed, then, for this operation are a fountain or Davidson syringe, attached to a small rubber tube or large silk catheter, an escape tube of large size of soft rubber, made long enough by the attachment of a long piece of tubing, so that the fluid escapes into a vessel on the floor. The hand holds and guides the tubes and changes their position from time to time.

The *colon* cannot be distended with water or irrigated with the same facility. That water can be made to pass through the sigmoid flexure there can be no doubt; but the passage of a tube through the flexure into the colon is a difficult task. If this is tried on the cadaver with the abdominal wall removed, one can see how difficult it is; the end of the instrument must describe a complete sharp curve on itself, as if it were about to tie itself into a knot. Even with the hand pressing on the passing instrument and guiding it, it is not easy to accomplish. It is clear from the experiments which I have made, that a partially flexible tube, like the old-fashioned stomach tube, should never be used, and that a small tube does not pass as readily as one which more nearly fills the bowel. Distending the rectum with water as the tube advances, does not favor the passage as much as leaving the bowel empty. The tube finds its way better along the mucus-covered mucous coat. I speak now only of experiments on the cadaver, when the eye is watching the process; the contrary is the general opinion of physicians from efforts on the living patient. But the turning of the instrument on itself in a cavity filled with water, when the end strikes against the wall is very likely to happen and can easily be mistaken for the onward progress of the instrument. In the rectum the finger introduced discovers the error of direction, but higher up it is not possible to do so.

The conclusion of many trials must convince anyone that the attempt to make the instrument enter the descending colon as often fails as succeeds. The difficulties show that all colon irrigation must be done by one tube. I have tried the double-current stomach irrigator and have had constant failure—the closure of the lumen from twists of the tube or from outside pressure prevents the exit of the injected fluid; so that the only way in which this can be accomplished is to force half a pint or one pint of fluid into the colon and then allow it to escape at once through the same tube; in this way the colon and sigmoid can be thoroughly washed out.

What are the indications for the choice of colon or rectal irrigation? In all cases of so-called catarrhal dysentery where the stools are small, contain blood and mucus and in all cases, mild or severe, where the general or local symptoms are relieved by washing the rectum, no attempt need be made to do more than this. For even when the disease extends into the sigmoid flexure and colon, the curative influence is transmitted along the bowel wall upward, as gargling the throat benefits laryngeal inflammation. If the patient continues to have fever, delirium, great restlessness, or other symptoms of general infection, or if stools are large, thin, with a gangrenous odor, containing blood, mucus, and tissue-like shreds, then the attempt should be made to make the tube pass in the sigmoid for higher injection. If the patient is on his left side, with hips raised, a gentle current may pass from a raised fountain syringe into the colon, even if the point of the tube has not passed beyond the first curve of the "flexure." I need not add that there is a danger of perforating an ulcer, even without much force being used, so that the operation should be done with the greatest gentleness. In the great majority of cases of dysentery as we see it, rectal irrigation may, I hope, by continuing experience be proved to be all that we need to gain the desired end.

The *quantity* of water used depends upon the circumstances of each case; as a rule it should pass in and out of the bowel until it runs clear, and both in the case of the colon and rectum the amount thrown in should be equalled or almost equalled by the amount which escapes; if the egress is not free the operation must be stopped until the trouble is remedied. There need be no limit to the quantity of water.

The *frequency* of irrigation is to be regulated by the number of stools, state of decomposition in the bowel, and other conditions; a good rule is to try to prevent the patient from having any stools at all; let his bowel be emptied only at your command through the inserted tube; at first once in three hours, later three times daily, as the outflowing fluid contains less blood and has less odor. *Keep the rectum empty and clean*, is the one rule.

At first wash the bowel once in three hours; later three times daily,

and so on with diminishing frequency as there are less odor, less blood, and finally less mucus. When mucus is no longer seen in the form of thin flakes the patient may be said to be well; but for a few days one daily irrigation serves a good purpose. Relapses should at once be met by a return to local treatment.

As an *irrigating fluid* water may be used plain, hot or cold, or may contain in solution any of the numerous antiseptics. Extreme cold or very hot water may be injected, but both must have a more or less irritating effect, and their action, in the nature of things, is intermittent. If a continued current of cold or hot water could be kept on the inflamed surface, the case would be different. The surgeon would not apply great heat or cold for five minutes to an inflamed ulcer of the skin and then leave the ulcer alone for three or more hours. It may be practicable to keep water flowing in and out of the rectum for many hours, but few patients could bear such continued distention of the sphincter.

Almost every *antiseptic* has received warm recommendation. Fifty-three cases of acute dysentery were treated at the Military Hospital at Oran with a 1 : 5000 bichloride solution. After the first day the stools were fewer in number, and in three or four days the mucus disappeared; tenesmus and pain were soon lessened.¹

Lemoine² treated fifty-four cases of dysentery with solutions of corrosive sublimate, 1 : 5000. Six ounces were injected into the rectum twice daily; later a solution of the strength of 1 : 3000 was injected twice daily. The fluid was not retained longer than ten minutes. Improvement followed immediately, and acute cases were cured in from one to three days. No systemic poisoning followed in any case.

Notwithstanding all this favorable testimony, the dangers of ulceration in the colon being set up by the remedy, and the grave doubts lately raised as to the value of corrosive sublimate as a germicide in just such conditions as exist in dysentery, deter one from using it at all. Under no circumstances should it be employed without an immediate outlet for the solution.

Tannin destroys bacterial life and renders ptomaines innocuous; it is recommended by Cantani for typhoid fever, and it may have as good an effect in dysentery for the same reason.

Salicylic acid, thymol, aseptol, sulpho-carbolate of zinc, alum, hydrochloric acid, carbolic acid, boric acid, the sulphites and hyposulphites have all been used and advised, but no sufficient number of cases have been treated by any one of these as to lead to its preference over all other remedies of the same class.

¹ Centralblatt f. klinische Medicin, No. 11, 1891.

² Bull. général de Thérapeutique, Paris, 1890.

Boric acid and carbolic acid are the only antiseptics I have used frequently; the results have led me to think that the former, or both together, give all we want, and as I believe that a great part of the benefit comes from the cleansing and complete emptying of the rectum, the least irritating and least dangerous germicide ought to be preferred.

A BACTERIOLOGICAL STUDY OF DRINKING-WATER.¹

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SINCE the opening of the Hygienic Laboratory of Michigan University, October 1, 1888, a large portion of my time, devoted to laboratory work, has been given to the bacteriological study of drinking water. While I have no great discovery to announce to you, I have thought that a brief record of the results obtained after three and one-half years of work might not be wholly devoid of interest. Health officers are given the privilege of sending samples of food and drink to the laboratory for examination, where the work is done for a small fee, which is supposed to cover the cost of material. I have been anxious from the first that this work should be of practical benefit to the people for whom it has been done, and should also constitute a contribution to science.

Having had, before beginning this work, some years of experience in the chemical analysis of drinking-water, and having been convinced of the inadequacy of the evidence furnished by the same, I have entrusted that part of the work, in most instances, to trained assistants, and I am sure that whatever its value may be, the work has been well done. Drs. F. W. Brewer and A. Ives have made most of the chemical analyses, which will be reported in part later in this paper. A small number of the chemical examinations, and all of the bacteriological work, has been done by myself, and I alone am responsible for any errors which may be detected in the same.

We keep at the laboratory a number of sterilized bottles with glass stoppers, and of two and one-half litres capacity. These bottles are sterilized by steam, then set in wooden crates so arranged that the handle of the crate holds the stopper in place, and makes it impossible to open the bottle without removing the handle, which is fastened by means of screws. The use of sealing wax is forbidden, and in cases where the over-zealous collector has resorted to this method "to make things more secure," the samples have been discarded and fresh bottles.

¹ Read before the Association of American Physicians at Washington, May, 1892..

have been sent, with the request that the sealing be omitted. In some instances a piece of sublimate gauze has been placed over the stopper and fastened about the neck of the bottle. This admits of the collector placing his seal upon the outside of the gauze. A health officer writes or telegraphs that he wishes one or more samples examined, and the desired number of bottles is sent. He is instructed to fill them and to return them immediately. In the great majority of cases the bacteriological examination has been begun at the laboratory within thirty-six hours after the samples have been collected. In some instances I have instructed the collector to obtain new bottles and to sterilize them, but as a rule this is not satisfactory, and many samples have been discarded on learning the method of sterilization employed; the above-described method is now exclusively used.

Immediately on receipt of the water at the laboratory, gelatin plates are made, and at the same time from two to six beef-tea tubes are inoculated with the water, and placed in an incubator at 38° C. The temperature at which these beef-tea tubes are kept is, as we shall see, a matter of importance. The amount of water added to the gelatin and beef-tea tubes has varied from one drop to one cubic centimetre. My experience has led me to prefer from three to six gelatin plates, each made with one drop of water, to one plate made with one cubic centimetre, provided that in the making of each plate a drop of water is taken up in a fresh pipette after shaking the water in the bottle. I am convinced that in this manner one is less likely to fail to get on the plates all the germs in the sample of water.

After the beef-tea tubes have stood in the incubator at 38° for twenty-four hours, it is observed whether or not any germs have developed, and a record is made of this observation. As we shall see further on, the greater number of the germs found in drinking-water do not multiply at all, or do so very feebly, at 38° C. Whether the germs have developed or not, animals are inoculated with the beef-tea cultures. If certain germs be present, some of the animals thus inoculated will die within a period of time which varies with the animal employed and the method of inoculation. Practically I have used in my routine work, in the majority of instances, white rats. The reasons for selecting this animal are the following: 1. The rat is easily kept and multiplies rapidly, and where one uses from three to four hundred animals in a year, this becomes a matter of some importance. If the animal does not die, it is not used in testing other samples of water, because of the fear that a tolerance for certain water germs may have been established. Some special experiments, however, recently made to test this point seem to show that I have overestimated this danger. 2. As compared with mice, and even with guinea-pigs and rabbits, the operation of inoculation *per se* has less effect upon the rat.

In the routine work, I have usually inoculated the rat by the injection of from one to two cubic centimetres of the beef-tea culture into the abdominal cavity. The reasons for selecting this method of inoculation are: 1. The greater certainty of killing, providing a toxicogenic germ is present, and, 2. the shortening of the length of time between the inoculation and death. These very reasons, however, which have led me to select this animal and the mode of inoculation in making the first rough test of the water, have also induced me to repeat the inoculations, using other animals and other methods of inoculation, in all cases where the results obtained by the routine tests were positive. I will give later on in detail the results of some of these inoculations.

If the animals die, plates are made from the spleen, liver, and kidney in *all* instances, and from the blood in some. The germs which develop on the plates made from these organs are compared with those on the plates made directly from the water, and tube cultures are made of all germs. In the majority of examinations each germ has been studied sufficiently to enable me to identify it. The number of germs on the plates made directly from the water are counted after twenty-four, forty-eight, and seventy-two hours, and as some plates have always been made with one drop of the water, the number on these is given in the table.

I have used the word "toxicogenic" in referring to those germs found in drinking-water which prove fatal to inoculated animals. I have also elsewhere employed the same term in referring to certain other germs. The word toxicogenic (poison-producing) explains itself, but it may be asked why I have taken the liberty of coining such a word, and exactly what meaning do I attach to it? How does it differ in meaning from pathogenic? I suppose that all now believe that germs which are harmful when introduced into the bodies of men and the lower animals owe their deleterious effects to certain chemical products which they elaborate. Therefore, all pathogenic germs are toxicogenic, but are all toxicogenic germs pathogenic? The answer to this question depends upon the meaning which one attaches to the word pathogenic. I prefer to use this word in the sense indicated by its derivation, *i. e.*, as disease-producing. Now, there are poison-producing germs which are fatal to man and some of the lower animals which are not known to induce any characteristic symptoms or any specific lesions. They grow and multiply in the body, sometimes with fearful rapidity, and prove speedily fatal. Such are the germs which induce the great variety of symptoms which we designate as the summer diarrhoeas of infancy, and which would more properly be called milk-poisoning. In the same class are those germs which cause serious results to follow the eating of sausage, cheese, canned salmon, lobster, etc. These germs, it seems to me, should not be said to be pathogenic, but they certainly are toxicogenic. Now, I find in drinking-water a number of germs differing from one another morpho-

logically and in their growth on various nutritive media, which do not, in the animals upon which I have experimented, induce any specific disease which can be recognized either by symptoms during life or by lesions after death. These germs I call toxicogenic. A germ, in order to be toxicogenic to a given animal, must multiply in the body of the animal and there elaborate its poison. In this way a germ may be toxicogenic to one animal and not to another.

We must distinguish between the germs which kill by virtue of the chemical poisons which they produce outside the body and those which produce chemical poisons within the body. This difference may be well illustrated by some of the water germs. If we allow the white liquefying bacillus of water to grow in beef-tea for some days at the ordinary temperature of a room, and then inject three or four cubic centimetres of the culture into the abdominal cavity of a white rat, the animal will succumb within a few hours. But this bacillus will not multiply at the temperature of the rat's body, and the fatal effects are due solely to the chemical poisons which the germ produced in the beef-tea before the inoculation. The truth of this may be demonstrated by filtering the culture through a Chamberland filter, and it will be found that the same amount of the germ-free filtrate will kill. I would not say that this germ is toxicogenic to the rat, and I have been careful in all of my experiments to avoid mistaking such a germ for those which I, in this paper, designate as toxicogenic germs. In the routine work this danger is avoided by keeping my beef-tea culture in an incubator the temperature of which will not fall below 38° C. Moreover, in order to satisfy myself that even when the germ is grown at this temperature, the fatal effects are not due to poisons generated in the tube, I have injected cultures which have been freed from germs by filtration through porcelain, and have found that six times the fatal quantity of the germ-containing cultures may be injected without fatal effect. Thus one cubic centimetre of a beef-tea culture of bacillus venenosus twenty-four hours old, invariably kills white rats, while six cubic centimetres of the same culture after filtration fails to cause death. It is true that a small amount of poison is produced in the tube, and this probably has some influence in slightly lowering the vitality of the animal, while the germ rapidly multiplies and produces a sufficient quantity of poison to cause death.

With the method of work now understood, I will give the conclusions which I have reached concerning the value of a bacteriological examination of water, and then will close with tabular statements of the investigations upon which these conclusions are based.

Some of the conclusions which have been reached in this study are as follows:

1. Many of the germs found in drinking-water will not grow at the

temperature of the human body. These germs, therefore, are not capable of inducing disease. It matters not how rich a given sample of water may be in these germs, if it contains no others it cannot be said that the water is a source of typhoid fever. The freedom from typhoid fever of communities using such waters seems to justify this conclusion. Such a water may not be, and certainly often is not, a desirable drinking-water. It may be turbid with suspended matter, unpleasant to the taste, and give off a disgusting odor, but there is no evidence that it can cause disease. Several interesting examples of this kind have come under observation. One of these may be mentioned. A certain city of about ten thousand inhabitants took for awhile its public water supply from a shallow lake, the bottom of which was covered with decomposing organic matter of vegetable origin. This water was turbid, unpleasant to the taste, and gave off unpleasant odors, but none of the bacteria in it grew at 38° C. On the other hand, many of the inhabitants of the city took their drinking-water from shallow wells, the water of which was clear, sparkling, and palatable. The well water, however, contained germs which grew abundantly at 38° C., and which were toxicogenic to animals. The use of the lake water in preference to that supplied by the wells was recommended early in the spring of 1891. Some followed the advice, others did not. During the summer and early fall of 1891 there were more than two hundred cases of typhoid fever in the city, and at a public meeting held by the State Board of Health in this place, about the last of October, every physician in the city agreed to the statement that there had not been a case of typhoid fever among those who had used the lake water exclusively. This positive testimony of the physicians was also confirmed by other citizens.

2. Of the germs which grow at 38° C. or at higher temperatures, some are fatal to animals when injected subcutaneously, while others are not. This renders a division of them into toxicogenic and non-toxicogenic germs possible.

3. There is no proof that these non-toxicogenic germs can multiply in the animal body. Indeed, all the evidence which has been gathered so far goes to show that they not only fail to multiply in the bodies of the rat, mouse, guinea-pig, and rabbit, but that they soon die when injected under the skin or into the abdomen. However, this does not furnish positive evidence that they would not multiply in the body of man. For these reasons waters containing these germs have not been positively condemned, though it has been advised in some cases that their use should be discontinued.

4. Some of the toxicogenic germs found in drinking-water produce the same symptoms and the same post-mortem appearances in the above-mentioned animals as are observed after the similar employment of

Eberth's germs. Moreover, their toxicogenic properties, as tested upon these animals, are fully equal to those of Eberth's germs. They will not only live, but will multiply in the animal body. Waters containing these germs have in all cases been condemned.

5. More than one germ obtained from drinking-water grows with an invisible growth on potato.

6. Several germs found in drinking-water will grow on the media proposed by Parietti, Uffelmann, and others, as means of recognition of the Eberth germ.

The results of the examination of one hundred and forty-eight waters are given in the table. The waters are divided into three classes. The first contains those which are supposed to be causing typhoid fever at the time the water is sent, or to have caused the disease prevailing at the time. In other words, the water has been sent on account of the present existence of typhoid fever among those using it. In the second class are those waters which are not supposed to be causing typhoid fever at the time, but which are suspicious on account of unsanitary surroundings, or on account of previous sickness among those drinking it. In the third class are given those waters which have not been suspected of causing sickness, and the sanitary surroundings of which are not said to be especially bad. Several of the third class have been sent for analysis in view of their possible selection for the water supply of cities and villages. The figures given in the chemical part of the table represent parts per million, the chlorine being calculated as sodium chloride. The chemical analyses are much more extensive than shown in the table. I have given the results of the estimation of free and albuminoid ammonia and chlorine, because much importance has generally been attached to these by chemists. In addition to the figures given in the table a record is made of the physical properties, hardness, amount of residue organic and inorganic, sulphates, earthy bases, nitrates, nitrites, and amount of oxygen consumed in the permanganate process. The number of germs in one drop of the water is given. In the column "kind of germ," the figures refer to the corresponding ones given in the descriptive tables of the individual germ, found later on. The germs which are indicated by the letters C, D, and E, are not given in the descriptive tables, because the cultures have been lost through negligence in not transplanting as often as should have been done. I have elsewhere¹ described these germs, and the following is a brief description of them :

Bacillus C rapidly liquefies gelatine, the liquefaction beginning at the surface. It forms gas, is stained by the ordinary agents and by Gram's method. It resembles Eberth's germ in the formation of an invisible

¹ The Medical News, June 14, 1890.

growth on potato, but in no other respect. Some twenty rats were killed with this germ. The minimum fatal amount of the twenty-four hours' culture for white rats seemed to be between ten and fifteen drops. One strange observation was made. Cultures nine or ten days old are apparently less virulent than those only twenty-four hours old. Moreover, the germ decreases in virulence as it is grown in the artificial media, until in about the sixth generation it may be employed in four times the quantity first used without any effect. The post-mortem appearances are quite different from those observed with Nos. 29 and 31, as given in the descriptive tables in this paper. The intestines are reddened, but the liver and spleen are tarry black. Cultures from these organs show numerous liquefying colonies.

Bacillus D is probably not pathogenic, but kills on account of the chemical poisons rapidly developed. Further study of this germ is needed before extended statements can be made concerning it. I can only say that it does not correspond with any germ given in the tables of Eisenberg.

Bacillus E is non-liquefying. It grows slowly in stick cultures, and forms a scarcely visible growth on potato. It decreases in virulence with artificial cultivation, and while none of the other germs in these waters showed any pathogenic properties in pure cultures, beef-tea inoculated with a drop of the water never failed to kill rabbits and rats, while bacillus E in pure cultures frequently failed to produce death. Moreover, after the death of these animals inoculated with the mixed culture, bacillus E was the only germ found living in the organs. The following quotation from my notes will illustrate this: October 28, 1889, a large rabbit was inoculated with sixty drops of beef-tea, to which one drop of the Negaunee public water had been added. October 21, animal found dead at 9 A. M. Post-mortem showed small intestines and mesentery highly inflamed; no other changes observable. Plates made from spleen, liver, and kidney showed pure culture of germ marked "Negaunee." It is possible that this is Eberth's germ, though of this I am not certain. Unless this be the exception, I have not found Eberth's germ in any of the waters.

The waters No. 140 to No. 147, inclusive, I have not been able to classify. When these samples were sent I preferred not to know the source of each water, and asked that they be designated by numbers. Since sending in my report I have twice written asking that I may be informed of the source of each water, but my request has not been answered. Omitting these samples, the remaining one hundred and forty samples are divided into the following classes, according to their supposed relation to typhoid fever. Thirty-three are placed in the first class, *i. e.*, they are waters which were believed to be causing typhoid fever at the time the samples were sent. Forty-four belong to the second

class, *i. e.*, while typhoid fever is not prevailing among those who are using the water, the water is regarded as suspicious on account of the former existence of typhoid fever or on account of unsanitary surroundings. Sixty-three belong to the third class. The first sixteen waters of first class I have elsewhere¹ discussed. In fifteen of these germs toxicogenic to the lower animals were found.

No. 90 in the next belonging to this class: The city of Sault Ste. Marie takes its water supply above the rapids, and ordinarily it is a very pure water. In the fall of 1890, owing to a break in the lock, more than two hundred boats were detained for two days above the lock and in the immediate vicinity of the intake. Some ten days later typhoid fever appeared, and the deaths were reported to be not less than thirty. All the cases appeared within a few weeks, and sample No. 90 was taken at this time. After this first outbreak there were no new cases. Samples 103, 104, and 105 were collected about one month later, and while the disease was still prevailing, but at a time when no new cases were being reported. I have, therefore, placed them in the second class.

No. 92 furnishes a lesson of interest. Typhoid fever was confined to a certain portion of the city. The supply-pipe carrying water to this portion was, I am told, a wooden one. At one point of its course a privy vault had been dug down upon the pipe, and had been used for some years. The wooden pipe, much decayed, was covered in the vault with fecal matter.

Dr. E. P. Christian, of Wyandotte, Mich., sent me samples Nos. 93 and 94, and along with these a sample of milk. The doctor had about thirty cases of continued fever, some of which he designated as typical and others as atypical typhoid. He soon ascertained that the families in which the typical cases existed took their milk from the same dairyman. No. 93 was taken from the well of the dairyman, and in both this and the milk I found bacillus *venenosus*. In the river water I found the liquefying toxicogenic bacillus. All who had the fever had used the river water, and some of those who drank both the milk and the river water had had the disease in an atypical form, but none of those who did not drink the milk had the typical form of the disease. These observations were reported to me by Dr. Christian after I sent him the report of the examination. My conclusions, as stated in the report, were as follows:

"I regard both the waters and the milk as unsafe. Of the two waters that from the well is the worst both chemically and bacteriologically. The milk was examined only bacteriologically. The poison-producing germ in the well water is identical with that in the milk. I am inclined to the opinion that if the typhoid fever is due to one of the waters, the well water is the one most likely to be the cause. Eberth's germ (the

¹ The Medical News, June 14, 1890.

so-called typhoid fever germ) was not found in any of the samples. This, however, does not mean, in my opinion, that the waters would not cause typhoid fever. I have never yet found Eberth's germ in drinking-water (with one possible exception). The river water probably has changed in character since the sample was taken, but the well water certainly should not be used."

The men who had typhoid fever at Torch Lake worked in a saw mill, which was located on the bank of the lake. The well from which sample No. 95 was taken was at the mill, and near both well and lake was a large privy vault used by the men while at work. Sample No. 96 was taken from a well which was used by these men when not at work, and was more than a quarter of a mile from both well (No. 95) and lake. I knew nothing of these facts until some time after I had reported, as the samples when sent to me were distinguished by numbers.

In Nos. 101 and 102 I could find no toxicogenic germ, although it was believed that these waters were at the time causing typhoid fever. No. 102 was taken from a farmer's well, and one member of the family after another came down with the fever. Whether there were other possible sources of infection about the place or not I do not know.

Sample No. 107 furnishes another illustration of my failure to find a toxicogenic germ in a water of the first class.

Nos. 109 and 110 were from wells from both of which the sick men had been accustomed to drink before coming down with the fever.

Nos. 111, 112, 113, and 114 came from the public water supply of Duluth, in January, 1891, during the prevalence of a very severe epidemic of typhoid fever. I found a toxicogenic germ in only one of the samples. This sample was taken, so the health officer informed me, from a tap in a doctor's office, the occupant of which had gone home some two weeks before with typhoid fever, and, so far as known, the tap had not been used since that time.

Every now and then some one announces a new test, by means of which the Eberth germ can be distinguished from other germs in water. These announcements are founded upon comparisons with a few water germs, or with those which happen to exist in one or two samples of water. None of these tests have been systematically tried with a large number of germs.

One of these tests, proposed by Parietti,¹ is made as follows: To 10 c.c. of neutral bouillon there are added from three to nine drops of the following solution:

Carbolic acid	5 grammes.
Pure hydrochloric acid	4 "
Distilled water	100 "

¹ "Metodo di ricerca del Bacillo del Tifo nelle acque potabili" Rivista d'Igiene e Sanità Pubblica, 1890.

From October 1, 1888, to May 1, 1890.

No.	Water sent from	Source.	Class.	Free ammonia.	Albuminoid ammonia.	Chlorine.	Number of germs.	Kind of germs.	Remarks.
1	Omaha, Nebraska,	Well	Second	0.168	0.118	129.0	50	No. 13 was found in all the Omaha samples. No. 10 in samples No. 4. No. 1 in Nos. 1, 3, and 4. Nos. 11 and 12 in samples 5, 7, 8, 9, and 10. Undescribed germs were found in samples 2 and 4.	Pure cultures of each of these germs in beef-ten, twenty four hours old, were injected into the abdominal cavity of rabbits and rats. All were without effect.
2	" "	"	"	0.080	0.124	97.0	46		
3	" "	"	"	0.064	0.230	12.0	120		
4	" "	"	"	0.162	0.116	45.0	50		
5	" "	"	"	0.094	0.112	23.0	25		
6	" "	"	"	0.028	0.090	34.0	18		
7	" "	"	"	0.022	0.102	48.0	38		
8	" "	"	"	0.172	0.088	48.0	36		
9	" "	"	"	0.054	0.068	98.0	20		
10	" "	"	"	0.032	0.096	8.0	8		
11	Coldwater, Mich.	"	"	0.270	0.045	8.0	500	Nos. 10, 13, and 16 were found in these waters.	Inoculations of rabbits were without effect.
12	" "	"	"	0.015	0.025	14.0	712		
13	" "	"	"	0.270	0.040	13.0	370		
14	" "	"	"	0.025	0.040	12.0	580		
15	Ida, Mich.	"	"	0.910	0.120	153.0	2000	No. 13	Inoculation of rabbit was without effect.
16	Brown City, Mich.	"	"	0.220	0.096	8.0	400	Nos. 10 and 13.	Inoculations of rabbits were without effect.
17	Kalamazoo, Mich.	"	Third	0.011	0.084	7.0	63	Nos. 10 and 13	" " "
18	" "	"	"	0.020	0.066	7.0	60		" " "
19	Mount Pleasant, Mich.	River	Second	0.094	0.208	73.0	3000	Nos. 10 and 13	Inoculations of rats were without effect.
20	Gambier, Ohio,	Well	"	0.065	0.062	210.0	683	Nos. 1, 10, 11, 12, 13, and 16	Inoculations of all the germs on rats and rabbits were without effect.
21	Allegan, Mich.	"	"	0.206	0.148	33.0	300	No. 13.	Inoculation of rabbit was without effect.
22	Three Rivers, Mich.	"	Third	0.070	0.016	9.0	25	No. 13	Inoculations of rats and rabbits were without effect.
23	" "	"	"	0.108	0.072	7.0	20		
24	" "	"	"	0.024	0.054	7.0	22	No. 13	Inoculations of rats were without effect.
25	Allegan, Mich.	Hydrant	"	0.220	0.066	31.0	40	No. 13	Inoculations of rats were without effect.
26	" "	Artesian	"	0.272	0.556	32.0	25	No. 13	
27	Coldwater, Mich.	Well	"	0.024	0.038	14.0	16	No. 13	Inoculations of rats were without effect.
28	Kalamazoo, Mich.	"	"	0.144	0.038	9.0	290	Nos. 10 and 13	Inoculation of rat was without effect.
29	Tecumseh, Mich.	"	Second	0.037	0.078	10.0	40	No. 13	Inoculations of rabbits were without effect.
30	Ishpeming, Mich.	Lake	Third	0.036	0.222	6.0	455	No. 13	Inoculation of rat was without effect.
31	" "	"	"	0.038	0.208	3.0	30	Nos. 10 and 13	Inoculations of rats and rabbits were without effect.
32	" "	"	"	0.038	0.086	0.9	30		
33	Three Rivers, Mich.	Well	"	0.290	0.036	0.9	39	No. 13	Inoculations of rats were without effect.
34	" "	"	"	0.060	0.102	0.7	25		
35	" "	"	"	0.016	0.062	1.0	22		

36	St. Louis, Mich.	Reservoir	Third	0.069	0.210	23.0	8100	Nos. 10, 12, 13, 16, and 20	Inoculations of rats and rabbits were without effect.
37	" "	Pino River	"	0.014	0.220	24.0	1008	Nos. 10, 13, and 16	Inoculations of rats were without effect.
38	Climax, Mich.	Well	Second	0.006	0.084	4.5	105	Bacillus D.	Rabbits inoculated with No. 39 died, while those inoculated with No. 40 were not affected.
39	Grand Rapids, Mich.	River	Third	0.030	0.134	10.0	36,000	"	Rats, guinea-pigs, and rabbits inoculated with [this germ died]; those
40	" "	"	"	0.024	0.075	6.0	120	No. 29	Rabbits inoculated with bacillus E died; those
41	Ann Arbor, Mich.	Cistern	First	2.223	0.908	3.0	3000	In No. 46, germs Nos. 1, 10, and 13 were found. In Nos. 42, 43, 44, and 45 there was found in addition to the above bacillus E.	Rabbits inoculated with the other germs from the same waters were not affected.
42	Negaunee, Mich.	"	"	0.232	0.368	30.0	920	No. 13	Rats were not affected.
43	" "	"	"	0.296	0.460	30.0	1240	Nos. 1, 10, and 13	Rats inoculated with this germ died.
44	" "	"	"	0.312	0.448	40.0	772	Bacillus G.	Inoculations of rats were without effect.
45	" "	Mine.	Third	0.042	0.236	140.0	2060	No. 13	Rats, guinea-pigs, and rabbits inoculated with No. 31 died.
46	" "	Sand Shaft	"	0.019	0.120	40.0	95	"	"
47	Mendon, Mich.	Well	Second	0.020	0.048	4.0	100	Nos. 1, 10, and 13	"
48	" "	"	"	0.020	0.210	31.0	100	"	"
49	Dearfield, Mich.	"	First	0.508	0.158	605.0	898	"	"
50	Northville, Mich.	"	Second	1.136	0.732	6.7	1350	"	"
51	Iron Mountain, Mich.	"	First	1.256	1.920	44.0	1500	"	"
52	" "	"	"	0.384	0.810	20.0	1350	Nos. 13 and 31 were found in all these waters.	"
53	" "	"	"	0.784	0.960	52.0	1260	"	"
54	" "	"	"	0.904	1.360	16.0	1700	"	"
55	" "	"	"	0.456	0.944	12.0	850	"	"
56	" "	"	"	0.464	1.256	28.0	950	"	"
57	Ann Arbor, Mich.	Cistern.	"	0.318	0.292	6.0	1204	No. 29	Rats, guinea-pigs, and rabbits inoculated with No. 29 died.
58	" "	"	"	0.492	0.501	9.0	1770	Nos. 13 and 31	No. 31 is fatal to rats, guinea-pigs, and rabbits.
59	Rankine, Illinois	Well	"	0.512	0.332	24.0	738	Nos. 10 and 13	Inoculations of rats were without effect.
60	Pomfret, Conn.	"	Second	0.104	0.116	4.0	151	No. 14	Rats inoculated with this germ were not affected.
61	Sherwood, Mich.	"	First	0.194	1.160	7.0	4116	"	Rats inoculated with E died.
62	Soudan, Minn.	Lake	Third	0.144	0.488	3.0	428	No. 11 and bacillus E.	Rats inoculated with No. 11 were not affected.
63	" "	"	"	0.132	0.488	4.0	439	No. 11	"
64	" "	Well	Second	0.120	0.090	2.0	28	No. 11	"
65	" "	"	"	0.072	0.124	2.0	4	No. 29	Rats inoculated with No. 29 died.
66	Lake City, Mich.	Lake	Third	0.154	0.280	3.0	124	No. 11	Rats were inoculated without effect.
67	Iron Mountain, Mich.	"	"	0.200	0.270	4.5	9	No. 11	"
68	Ironwood, Mich.	Well	"	0.176	0.218	9.9	12	No. 11	"
69	Ann Arbor, Mich.	Spring	"	0.012	0.016	2.5	0	No. 11	"
70	" "	"	"	0.044	0.120	4.0	4	No. 11	"
71	" "	"	"	0.050	0.080	6.0	0	No. 11	"
72	" "	"	"	0.090	0.214	4.0	6	No. 11	"
73	Leslie, Mich.	Well	Second	0.536	0.819	14.0	101	Nos. 11 and 13	"
74	" "	"	"	1.144	0.984	12.5	2940	No. 14	"
75	Ann Arbor, Mich.	"	Third	0.054	0.064	17.0	150	No. 14	"
76	" "	"	"	0.008	0.070	6.0	60	No. 14	"
77	" "	Spring	"	0.124	0.191	3.5	235	No. 11	"

SAMPLES OF DRINKING-WATER EXAMINED IN THE HYGIENIC LABORATORY OF MICHIGAN UNIVERSITY.
From May 1, 1890, to May 1, 1892.

No.	Water sent from	Source.	Class.	Free ammonia.	Albuminoid ammonia.	Chlorine.	Number of germs.	Kind of germs.	Remarks.
78	Three Rivers, Mich.	Well	Third	0.015	0.019	6.288	8 after 72 hours	No. 13	1 c.c. of beef-ten, twenty-four hours old, was injected into the abdominal cavity of rats without effect.
79	East Lake, Mich.	"	"	0.007	0.058	44.74	None	.....	60 drops of beef-ten, twenty-four hours old, were injected into the abdominal cavity of rabbit without effect.
80	Gladwin, Mich.	"	"	0.374	0.011	11.8	63 after 48 hours	Nos. 13 and 14	Inoculation of rat was without effect.
81	Alpena, Mich.	Hydrant	"	0.118	0.37	6.60	22 after 72 hours	Nos. 10 and 13	
82	"	Spring	"	0.072	0.174	4.61	2880 after 72 hours	Nos. 10 and 13	Inoculations of rats were without effect.
83	Soudan, Minn.	Well	"	0.05	0.156	1.81	6 after 72 hours	No. 14	Inoculation of rat was without effect
84	"	"	"	0.058	0.132	2.14	3 after 72 hours	Nos. 10 and 13	Inoculations of rats were without effect.
85	"	"	"	0.076	0.14	2.14	None	.....	Inoculation of rat without effect.
86	Gladwin, Mich.	(Artesian)	"	0.26	0.102	1.32	10	Unknown	60 drops of beef-ten, twenty-four hours old, injected into abdominal cavity of guinea-pig. Animal died.
87	Inlay City, Mich.	"	"	0.52	0.052	1321.00	98 after 48 hours	Nos. 10 and 13 and unknown	1 drachm of beef-ten, twenty-four hours old, injected into abdominal cavity of a rat. Death in six hours.
88	Gladwin, Mich.	"	"	0.526	0.116	21.45	12 after 72 hours	Nos. 10 and 13	20 drops of beef-ten culture, twenty-four years old, injected into abdominal cavity of rat. No effect.
89	Inlay City, Mich.	"	"	0.462	0.102	1328.25	None	.....	Inoculation of rat with negative results.
90	South St. Marie, Mich.	Lake	First	0.221	0.168	3.30	2000	No. 28	1 drachm of beef-ten, twenty-four hours old, injected into abdominal cavity of rat produced death.
91	Bay City, Mich.	Hydrant	Third	0.34	0.48	425.70	420	No. 10	Inoculation of rat produced no effect.
92	"	"	First	1.00	0.68	465.30	450	No. 31	
93	Wyandotte, Mich.	Well	"	0.40	0.56	266.4	2430	Nos. 10 and 28	20 drops of beef-ten, twenty-four hours old, injected into abdominal cavity of rat produced death.
94	"	River	"	0.08	0.52	49.5	1770	Nos. 10 and 31	20 drops of beef-ten culture, twenty-four hours old, injected into abdominal cavity of rat produced death.
95	Torch Lake, Mich.	Lake	"	.....	.....	.....	5281	Nos. 10 and 28	20 drops of beef-ten culture, twenty-four hours old, injected into abdominal cavity of rat produced death.
96	"	Well	"	.....	.....	.....	2520	No. 10	20 drops of beef-ten culture, twenty-four hours old, injected into abdominal cavity of rat caused death. Inoculation of a rat produced no effect.

97	Torch Lake, Mich.	Well	First	.....	.....	20	Nos. 10 and 28	Injection of 20 drops of beef-tea culture, twenty-four hours old, into peritoneal cavity killed rat.
98	Pontiac, Mich.	Hydrant	Second	0.422	0.574	23 after 48 hours	Nos. 10 and 13 and unknown	Inoculations of rats were without effect.
99	"	Lake	"	0.266	0.302	18 after 48 hours	No. 10	Inoculation of rat was without effect.
100	"	"	"	0.130	0.35	12 after 48 hours	No. 10	"
101	Negunsee, Mich.	"	First	0.024	0.820	10	No. 10	"
102	Parna, Mich.	Well	"	0.058	0.124	12 1/4	No. 10	"
103	Sault Ste. Marie, Mich.	Lake	Second	0.05	0.104	5	No. 4	"
104	"	"	"	0.06	0.12	12	No. 4	"
105	"	"	"	0.176	0.16	150	Nos. 10 and 4	"
106	Bay City, Mich.	Hydrant	Third	0.366	0.38	350	No. 10	Inoculations of rats were without effect.
107	Pontiac, Mich.	Well	First	0.198	0.368	240	No. 10	Inoculation of rat was without effect.
108	Three Rivers, Mich.	"	Third	0.472	0.212	26	No. 13	"
109	St. Johns, Mich.	"	First	0.091	0.13	11,025 after 48 hours	Nos. 10 and 13 Nos. 13 and 28	Inoculations of rats were without effect. 1 c.c. of beef-tea culture, twenty-four hours old, was injected into the abdominal cavity of each of three rats; one died, two recovered.
110	"	"	"	0.13	0.122	6	Nos. 10, 13, 4	Inoculations of rats were without effect.
111	Duluth, Minn.	Lake	"	0.01	0.124	200	No. 10	1 c.c. of a culture, forty-eight hours old, was injected into abdominal cavity of rat, results negative.
112	"	"	"	0.058	0.12	198	No. 10	1 c.c. of a culture, forty-eight hours old, was injected into abdominal cavity of rat; result negative.
113	"	"	"	0.007	0.264	20	Nos. 4, 10, 30	1 c.c. of a culture, forty-eight hours old, was injected into abdominal cavity of rat; result death.
114	"	"	"	0.038	0.058	1	No. 10	Inoculation of rat was without effect.
115	"	Spring	Third	0.038	0.07	12 after 48 hours	No. 4	"
116	Lendville, Col.	From a mine	"	0.094	0.094	145 after 75 hours	Nos. 10 and 4	Inoculations of rats were without effect.
117	"	Well	"	0.444	0.441	6	No. 10	"
118	Iron Mountain, Mich.	Hydrant	"	0.57	0.57	6	No. 10	Inoculation of rat was without effect.
119	"	Lake	"	0.312	0.312	2	No. 10	"
120	"	"	Second	0.11	0.322	5	No. 10	"
121	"	"	"	0.092	0.314	4	No. 10	"
122	Gaylord, Mich.	Unknown	Third	0.39	0.98	670 after 48 hours	No. 13	Rats were inoculated without effect.
123	Iron Mountain, Mich.	"	Second	0.03	0.15	8	No. 13	Injection of 20 drops of beef-tea culture, twenty-four hours old, into abdominal cavity of a rat produced no effect.
124	Norway, Mich.	"	Third	0.01	0.03	6	Nos. 10 and 13	20 drops of beef-tea culture, twenty-four hours old, injected into the abdominal cavity of a rat produced no effect.
125	"	"	"	0.02	0.15	10	Nos. 10 and 13	20 drops of beef-tea culture, twenty-four hours old, injected into the abdominal cavity of a rat produced no effect.
126	"	"	"	0.005	0.01	6	No. 13	Inoculation of rat was without effect.
127	Adrian, Mich.	Well	First	0.03	0.20	40 after 24 hours	Nos. 10 and 28	20 drops of beef-tea, twenty-four hours old, were injected into the abdominal cavity of a rat. Death resulted.

No.	Water sent from	Source.	Class.	Free ammonia.	Albuminoid ammonia.	Chlorine.	Number of germs.	Kind of germs.	Remarks.
128	Iron Mountain, Mich.	Water works	Third	0.005	0.025	2.0	13 after 24 hours	Nos. 10 and 21	Rats were inoculated without effect.
129	Pontiac, Mich.	Well	"	0.18	0.10	12.0	30 after 72 hours	Nos. 14 and 21	" " " "
130	Ironwood, Mich.	River	Second	0.103	0.116	5.6	400 after 24 hours	Nos. 10, 12, 13	" " " "
131	Iron Mountain, Mich.	Spring	Third	0.07	0.05	0.42	4	Nos. 10, 25, 26	" " " "
132	Ithaca, Mich.	Unknown	"	0.41	0.13	25.0	500 after 24 hours	Unknown.	20 drops of beef-tee, twenty-four hours old, were injected into the abdominal cavity of a rat without effect.
133	Hastings, Mich.	Well	Second	0.20	0.11	18.0	880	Nos. 14 and 15	Rats were inoculated without effect.
134	Iron Mountain, Mich.	Lake	Third	0.15	0.08	1.3	4	Nos. 10 and 3	" " " "
135	"	Spring	"	0.34	0.106	1.0	2	Nos. 10 and 3	" " " "
136	Ithaca, Mich.	Well	"	0.302	0.24	2.8	None	.....	Rat was inoculated without effect.
137	Holland, Mich.	(deep)	Second	0.008	0.09	13.85	20	Nos. 13 and 14	Rats were inoculated with negative results.
138	"	Water works.	"	0.514	0.166	15.675	189 after 48 hours	Nos. 13 and 14	" " " "
139	"	Well	"	0.088	0.131	6.93	120 after 48 hours	Nos. 13, 14, 20	" " " "
140	Chicago, Ill.	(shallow)	.....	0.310	0.198	11.55	7	Nos. 9, 10, 24	" " " "
141	"	.....	.....	0.012	0.06	10.395	90 after 48 hours	Nos. 17, 18, 23	" " " "
142	"	.....	.....	0.31	0.148	14.85	4	Nos. 2 and 11	" " " "
143	"	.....	.....	0.178	0.166	8.25	6	Nos. 7, 15, 26	" " " "
144	"	.....	.....	0.44	0.196	10.98	9	Nos. 3 and 27	" " " "
145	"	.....	.....	0.176	0.106	13.20	48 after 48 hours	Nos. 2, 8, 9, 19, and 27	" " " "
146	"	.....	.....	0.14	0.106	12.705	6	Nos. 2, 7, 10, 15, 19, 22	" " " "
147	"	.....	.....	0.18	0.24	18.48	5	Nos. 6, 11, 13, 23	" " " "
148	Dunkirk, N. Y.	.....	Second	0.091	0.16	2.478	60 after 48 hours	Nos. 10 and 27	" " " "

The tubes thus prepared are kept in the incubator for twenty-four hours at 37° in order to see that no contamination with germs from the air has occurred. To the tubes which remain clear, from one to ten drops of the suspected water is added, and the tubes returned to the incubator. If the beef-tea becomes cloudy within the next twenty-four hours, one can, according to Parietti, positively conclude that the typhoid germ is present. The excellence of this test has been attested by Kamen.¹

Of the seven water germs described in the following tables as growing at 38°, every one grows abundantly in Parietti's solution. Of the twenty-four remaining germs, two were not tested and three were found to grow in Parietti's solution. These three are germs which grow feebly at 38° in ordinary beef-tea, and the addition of Parietti's solution did not further retard their growth.

Uffelmann² proposes a test by which many water germs can be excluded in searching for the Eberth germ. His medium consists of a citric acid gelatin, colored with methyl-violet. He states that only a small number of germs, other than the Eberth germ, will grow on this gelatin, and that these do not take up the coloring matter like the Eberth germ. Of the thirty-one water germs upon which I have made this test, nine grow, and some of these stain more intensely than Eberth's germ.

I have used the potato gelatin test of Holz,³ with and without the addition of carbolic acid as is recommended, with all the toxicogenic germs described in this paper, and I find that all grow quite as readily and abundantly as the Eberth germ.

No. 1. *Micrococcus Candicans*.

Form. Large cocci often grouped in clusters, which vary much in size.

Growth:

On gelatin plates. Superficial colonies look like minute drops of milk. The deeper ones are more or less brown and granular.

In gelatin tubes. Grows along the line and forms a "nail head" on the surface.

On agar. A yellowish or brownish growth.

On potato. A white, slimy growth.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, but not at 38°.

Rate of growth. Rapid.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

¹ Centralblatt f. Bakteriologie u. Parasitenkunde, B. xi, No. 2.

² Berliner klinische Wochenschrift, 1891, No. 35.

³ Zeitschrift f. Hygiene, B. viii, S. 143.

No. 2. *Micrococcus Aquatilis Albus*.

Form. Small cocci.

Growth:

On gelatin plates. Snow-white dots. Spherical colonies with many irregular forms.

In gelatin tubes. Very slight along the line, and spreading but little over the surface. The growth on the gelatin is not abundant.

On agar. Very slight, white growth.

On potato. Thick directly over the place of application, but spreading very little. The color is yellowish-white.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows slowly at ordinary temperature, and more feebly at 38° C.

Rate of growth. Very slow.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 3. *Micrococcus Aquatilis Magnus*.

Form. Very large micrococci.

Growth:

On gelatin plates. Deep brown colonies, with smooth outline.

In gelatin tubes. Few isolated colonies along the track. Spreads over the surface.

On agar. White, thin growth.

On potato. White or brownish granular growth.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, and feebly at 38° C.

Rate of growth. Moderate.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 4. *Micrococcus Luteus*.

Form. Small micrococci, growing in zoöglea.

Growth:

On gelatin plates. Sulphur-yellow, granular colonies.

In gelatin tubes. Grows along the line and slowly spreads over the surface.

On agar. A lemon-yellow growth.

On potato. An abundant growth, which is at first dirty white, but which gradually becomes lemon-yellow.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, but not at 38° C.

Rate of growth. Rapid.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. Lemon-yellow.

Toxicogenic properties. Negative.

No. 5. *Micrococcus Cereus*.

Form. Micrococci.

Growth:

On gelatin plates. Pale, yellow colonies, of smooth outline.

In gelatin tubes. Very slight along the track; spreads slowly over the surface.

On agar. Very faint, white growth.

On potato. Yellowish white, waxy growth. Beyond the border of the growth the potato becomes bluish gray.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, but does not grow at 38° C.

Rate of growth. Slow.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White to brownish-yellow.

Toxicogenic properties. Negative.

No. 6. *Micrococcus Subflavus*.

Form. Elliptical micrococci, growing in zoöglea.

Growth:

On gelatin plates. Yellowish-brown, spherical colonies.

In gelatin tubes. Very slight along the track; spreads slowly over the surface.

On agar. White to yellowish-white.

On potato. Pale, yellow growth, with sloping edges.

In Parietti's solution. Does grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, and feebly at 38° C.

Rate of growth. Moderate.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. Pale yellow.

Toxicogenic properties. Negative.

No. 7. *Micrococcus Aquatilis Invisibilis*.

Form. Oval cocci.

Growth:

On gelatin plates. Deep brown colonies, with smooth outline; spreading irregularly superficially.

In gelatin tubes. Slight growth along the line, but spreading on the surface.

On agar. White, thin growth.

On potato. Invisible.

In Parietti's solution. Does grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, but feebly at 38° C.

Rate of growth. Slow.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 8. *Diplococcus Aquatilis*.

Form. Diplococci.

Growth:

On gelatin plates. Smooth, pale yellow colonies, mostly spherical, but showing some irregularities.

On gelatin tubes. Growth confined to surface, where it spreads to the walls of the tube.

On agar. Smooth, white growth.

On potato. Dirty white and glazed; thick, with sloping borders.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Does not grow at 38°; grows well at ordinary temperature.

Rate of growth. Moderate.

Relation to air. Aërobic.

Production of gas. None.

Liquefaction. None.

Color. White.

Toxicogenic properties. Negative.

No. 9. *Streptococcus Aquatilis*.

Form. Large micrococci; some single, others in pairs, and some in chains of from four to eight.

Growth:

On gelatin plates. Colonies spherical, many having notched outlines.

In gelatin tubes. Grows very slightly along the line, but spreads over the surface to the walls of the tube.

On agar. Very thin, white growth.

On potato. Heavy, moist, white growth.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Does not grow at 38°; grows at ordinary temperature.

Rate of growth. Slow on gelatin; rapid on potato.

Relation to air. Aërobic.

Production of gas. None.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 10. *Bacillus Fluorescens Liquefaciens*.¹

Form. Very small bacilli; twice as long as broad.

Growth:

On gelatin plates. Small, round colonies, liquefying and sinking into the gelatin.

In gelatin tubes. Liquefies gelatin rapidly from surface evenly to bottom; no scum on surface; deposit heavy and yellowish white. The supernatant fluid is yellowish, with green fluorescence, most marked near the surface.

On agar. Thin white growth.

On potato. Smooth growth, with yellowish tint and sloping margins.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

¹ I have found two varieties of this germ. The second differs from the one described in this table in the following particulars: 1. In gelatin tubes the liquefaction proceeds slowly, and after half or two-thirds of the gelatin has been liquefied, ceases altogether; the subjacent gelatin showing marked fluorescence. 2. It grows abundantly in Uffelmann's gelatin, and takes the stain more markedly than does Eberth's germ.

Effect of temperature. Grows at ordinary temperature, but does not grow at 38° C.
 Rate of growth. Rapid at ordinary temperature.
 Relation to air. Aërobic.
 Production of gas. None observed.
 Liquefaction. Liquefies rapidly and completely.
 Color. Yellowish white.
 Toxicogenic properties. Negative.

No. 11. *Bacillus Fluorescens Non-liquesfaciens*.

Form. Small bacilli, with rounded ends.

Motility. Non-motile.

Growth:

On gelatin plates. Glistening, mother-of-pearl colonies, spreading on the surface.

In gelatin tubes. Growth confined to surface, and dirty yellow in color; subjacent gelatin shows green fluorescence.

On agar. White on the surface, while the mass of agar becomes green.

On potato. Grayish white or brown growth, with glistening surface.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, but does not grow at 38° C.

Rate of growth. Rapid at ordinary temperature.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Non-liquefying.

Color. White, or yellowish to brownish white.

Toxicogenic properties. Negative.

No. 12. *Bacillus Gasoformans*.

Form. Small bacilli, two to three times as long as broad.

Motility. Motile.

Growth:

On gelatine plates. Large colonies, which rapidly liquefy the gelatin.

In gelatin tubes. Rapidly liquefies the gelatin, and bubbles of gas form along the line of inoculation.

On agar. A brownish or yellowish growth.

On potato. Dirty white growth.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, but not at 38° C.

Rate of growth. Rapid.

Relation to air. Aërobic.

Production of gas. Produces gas abundantly.

Liquefaction. Liquefies gelatin rapidly.

Color. White.

Toxicogenic properties. Negative.

No. 13. *Bacillus Liquefaciens Albus*.

Form. Small rod, with rounded ends.

Motility. Very motile.

Growth:

On gelatin plates. Small, round colonies, liquefying rapidly.

In gelatin tubes. Grows rapidly, and completely liquefies the gelatin.

- On agar. A dirty white growth.
 On potato. Yellowish or brownish white.
 In Parietti's solution. Does not grow.
 In Uffelmann's gelatin. Does not grow.
 Effect of temperature. Does not grow at 38°; grows well at ordinary temperature.
 Rate of growth. Moderate.
 Relation to air. Aërobic.
 Production of gas. The gelatin tubes give off no odor, and for this reason this germ must not be confounded with the bacillus liquefaciens, as described by Eisenberg.
 Liquefaction. Liquefies rapidly.
 Color. White.
 Toxicogenic properties. Negative.

No. 14. *Bacillus Albus*.

- Form. Short bacilli, often in chains.
 Motility. Motile.
 Growth:
 On gelatin plates. White, smooth colonies.
 In gelatin tubes. Grows slowly along the line of inoculation, and forms a white "nail head" on the surface.
 On agar. A milk-white growth.
 On potato. A dirty yellowish-white growth.
 In Parietti's solution. Does not grow.
 In Uffelmann's gelatin. Does not grow.
 Effect of temperature. Grows at ordinary temperature, but does not grow at 38° C.
 Rate of growth. Slow.
 Relation to air. Aërobic.
 Production of gas. None observed.
 Liquefaction. Does not liquefy.
 Color. White.
 Toxicogenic properties. Negative.

No. 15. *Bacillus Albus Putridus*.

- Form. Long and short bacilli, often growing in chains.
 Motility. Motile.
 Growth:
 On gelatin plates. Round, white or brown colonies.
 In gelatin tubes. Growth confined to surface, where it becomes very heavy. Liquefaction extends downward very slowly. (In these respects this germ differs from that described by Eisenberg under this name.) The contents of the tube give off a highly offensive odor.
 On agar. Heavy, smooth growth.
 On potato. Slimy, grayish-white; later, brownish growth.
 In Parietti's solution. Does not grow.
 In Uffelmann's gelatin. Does not grow.
 Effect of temperature. Does not grow at 38°; grows well at ordinary temperature.
 Rate of growth. Rapid.
 Relation to air. Aërobic.
 Production of gas. Gives off putrefactive odors.
 Liquefaction. Liquefies slowly.
 Color. White, or yellowish white.
 Toxicogenic properties. Negative.

No. 16. *Bacillus Violaceus*.

- Form. Bacilli about three times as long as broad, often growing in threads.
 Motility. Motile.
 Growth:
 On gelatin plates. The colonies look like small air bubbles to the unaided eye. Under the microscope the colonies are granular and violet. Sometimes the surface of the gelatin is raised like a foam.
 In gelatin tubes. Produces a funnel-shaped liquefaction, while the pale violet mass of germs lies at the bottom.
 On agar. A blue to violet growth.
 On potato. A dark violet growth.
 In Parietti's solution. Not tested.
 In Uffelmann's gelatin. Not tested.
 Effect of temperature. Grows at ordinary temperature, but not at 38° C.
 Rate of growth. Moderate.
 Relation to air. Facultative anaërobic.
 Production of gas. None observed.
 Liquefaction. Liquefies.
 Color. Produces a violet color.
 Toxicogenic properties. Negative.

No. 17. *Bacillus Gracilis Aërobiens*.

- Form. Bacilli four to six times as long as broad.
 Motility. Motile.
 Growth:
 On gelatin plates. Small, yellow colonies of rapid growth.
 In gelatin tubes. Grows abundantly along the track.
 On agar. Grayish-white, feeble growth.
 On potato. A waxy growth of pinkish-white color, while beyond the growth the potato becomes steel gray.
 In Parietti's solution. Does not grow.
 In Uffelmann's gelatin. Grows abundantly, and stains more intensely than does Eberth's germ.
 Effect of temperature. Grows at ordinary temperature; does not grow at 38°.
 Rate of growth. Rapid.
 Relation to air. Aërobic.
 Production of gas. None observed.
 Liquefaction. Negative.
 Color. White to gray.
 Toxicogenic properties. Negative.

No. 18. *Bacillus Gracilis Anaërobiescens*.

- Form. Bacilli three times as long as broad, often growing in long, slender rods.
 Motility. Very motile.
 Growth:
 On gelatin plates. Brownish colonies, spreading irregularly.
 In gelatin tubes. Grows abundantly along the line, and also spreads over the surface.
 On agar. Thin, white growth.
 On potato. Growth is yellowish white, abundant and prominent. Stains made from potato show long threads, with shorter bacilli near, often presenting the appearance of fringe.
 In Parietti's solution. Grows.
 In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, and feebly at 38°.

Rate of growth. Rapid.

Relation to air. Grows under gelatin.

Production of gas. Forms gas abundantly when grown under gelatin.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 19. *Bacillus Helvolus*.

Form. Short bacilli, often growing in chains, and frequently forming long threads.

Motility. Only an oscillation.

Growth:

On gelatin plates. Small, yellowish or brownish colonies.

In gelatin tubes. Forms on the surface a spreading white growth, which later becomes yellow. The growth spreads to the walls of the tube, and very slowly sinks in the gelatine as liquefaction goes on. The growth along the line is very slight, or wanting altogether.

On agar. Yellowish white growth.

On potato. Yellow.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, but only feebly at 38°.

Rate of growth. Slow.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Liquefies very slowly.

Color. White to yellow.

Toxicogenic properties. Negative.

No. 20. *Bacillus Rubidus*.

Form. A bacillus four to six times as long as broad.

Motility. Sluggishly motile.

Growth:

On gelatin plates. Yellowish, irregular colonies.

In gelatin tubes. Slight growth of isolated colonies along the line; these soon become pink in color. The growth at the surface is abundant, and as the gelatin liquefies large masses of the germ, with faint pink tint along the lower border, float in the liquid.

On agar. Faint yellowish growth, with no evidence of the possible development of color shown on some other media.

On potato. The growth has at first a slight pinkish tint, which, with age, develops into a beautiful red.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature, but does not grow at 38° C.

Rate of growth. Moderate.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Liquefies slowly.

Color. Red.

Toxicogenic properties. Negative.

No. 21. *Bacillus Cinnabareus*.

Form. A short bacillus.

Motility. Highly motile.

Growth:

On gelatin plates. Brick-red colonies.

In gelatin tubes. Liquefies rapidly and completely.

On agar. Cinnabar-red growth.

On potato. An abundant growth, at first yellowish-white, becoming more red with age.

In Parietti's solution. Not tested.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature; does not grow at 38° C.

Rate of growth. Rapid.

Relation to air. Not tested.

Production of gas. None observed.

Liquefaction. Liquefies rapidly.

Color. Cinnabar-red.

Toxicogenic properties. Negative.

No. 22. *Bacillus Subflavus*.

Form. Bacilli two to three times as long as broad.

Motility. Motile.

Growth:

On gelatin plates. Small, glistening, white, irregular colonies.

On gelatin tubes. Grows but slightly along the track; spreads over the surface. The tube shows slight fluorescence.

On agar. Yellowish-white growth; with age the mass of agar becomes brownish-yellow.

On potato. A beautiful salmon-colored granular growth.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Grows abundantly, and stains more intensely than Eberth's germ.

Effect of temperature. Grows at ordinary temperature; does not grow at 38° C.

Rate of growth. Rapid.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. Yellowish-white.

Toxicogenic properties. Negative.

No. 23. *Bacillus Ochraceus*.

Form. Bacilli two to three times as long as broad, with rounded ends.

Motility. Non-motile. (In which respect it differs from Zimmermann's germ of the same name.)

Growth:

On gelatin plates. Small, yellow, irregular colonies, spreading slightly over the surface.

In gelatin tubes. Slowly liquefies evenly from the surface; the mass of germ lying on the bottom of the liquefied part, and showing at first a pale yellow, then an orange growth.

On agar. Forms an even yellow growth.

On potato. A beautiful and abundant growth of ochre yellow. This growth is very thick and heavy, and in this respect differs from the germ of Zimmermann.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Does not grow at 38°; grows well at ordinary temperature.

Rate of growth. Moderate.

Relation to air. Aërobic.

Production of gas. None.

Liquefaction. Liquefies slowly.

Color. Orange to ochre.

Toxicogenic properties. Negative.

No. 24. *Bacillus Figurans*.

Form. Bacilli two to three times as long as broad, but showing marked variation in form. Sometimes they appear as very short bacilli, while at other times they grow into long threads.

Motility. Sluggishly motile.

Growth:

On gelatin plates. The deep colonies are spherical and smooth, but the superficial growth forms curved and interlacing lines, often presenting most grotesque figures. Plates may show no liquefaction after some days.

In gelatin tubes. Does not develop along the line. Generally liquefies from the surface before the growth has reached the walls of the tube. Liquefaction, however, goes on very slowly, and, in some instances, the fluid is lost by evaporation as fast as it liquefies, and consequently there is apparently no liquefaction. After the gelatin has been liquefied half way down the tube, the mass of germs subsides, and further liquefaction is very slow or does not occur at all.

On agar. Forms a thin white growth, with heavy deposit often in water of condensation.

On potato. Abundant, faintly yellow, mucilaginous growth, without raised edges.

In Parietti's solution. Does not grow.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows well at ordinary temperature; feebly at 38° C.

Rate of growth. Very rapid at ordinary temperature.

Production of gas. None observed.

Liquefaction. Liquefies half-way down the tube.

Color. White.

Toxicogenic properties. Negative.

No. 25. *Micrococcus Aquatilis*.

Form. Small cocci, often in groups.

Growth:

On gelatin plates. Small, round, white colonies.

In gelatin tubes. Very feeble growth along the line, but spreading over the surface.

On agar. White, thin growth.

On potato. Brownish, moist growth.

In Parietti's solution. Grows.

In Uffelmann's gelatin. Does not grow.

Effect of temperature. Grows at ordinary temperature, also at 38° C.

Rate of growth. Slow.

Relation to air. Aërobic.

Production of gas. None observed.

Liquefaction. Negative.

Color. White.

Toxicogenic properties. Negative.

No. 26. *Bacillus Albus Anaërobiescens*.

Form. Bacilli, two to three times as long as broad.

Motility. Only an oscillation.

Growth:

On gelatin plates. Smooth, spherical, yellowish or brownish colonies.

In gelatin tubes. Grows well along the track, and spreads over the surface.

On agar. Heavy, milk-white growth.

On potato. Yellowish-white, glistening growth.

In Parietti's solution. Grows.

In Uffelmann's gelatine. Grows, and stains with the same intensity as Eberth's germ.

Effect of temperature. Grows at ordinary temperature, and also at 38° C.

Rate of growth. Rapid.

Relation to air. Grows under gelatin.

Production of gas. None observed.

Liquefaction. Does not liquefy.

Color. White.

Toxicogenic properties. Negative.

No. 27. *Bacillus Invisibilis*.

Form. Large bacilli, from two to five times as long as broad, with rounded ends.

Motility. Motile.

Growth:

On gelatin plates. Pale yellow burr-like colonies, with irregular outline, and spreading slightly.

In gelatin tubes. Grows abundantly along the track, and spreads slowly over the surface.

On agar. Thick white growth, with but little tendency to spread.

On potato. Invisible growth.

In Parietti's solution. Grows.

In Uffelmann's gelatin. Grows abundantly, but does not take up the stain.

Effect of temperature. Grows at ordinary temperature, and at 38°.

Rate of growth. Rapid.

Relation to air. Grows under gelatin.

Production of gas. None observed.

Liquefaction. Does not liquefy.

Color. White.

Toxicogenic properties. Negative.

No. 28. *Bacillus Venenosus*.

Form. A bacillus from two to four times as long as broad, with rounded ends.

Motility. Very motile.

Growth:

On gelatin plates. Small, white dots, spherical, and sometimes slightly yellow. The superficial colonies are raised above the surface of the gelatin.

In gelatin tubes. Grows abundantly along the line, and slowly spreads over the surface. When taken from the spleen of an animal which has died twelve days or later after inoculation, the tendency to spread over the surface of the gelatin is less marked than with the germ which has not passed through the animal body.

On agar. A thin white growth.

On potato. A light brown, moist growth. When the germ is taken from the spleen of an inoculated animal the growth is often invisible.

In Parietti's solution. Grows abundantly.

In Uffelmann's gelatin. Grows abundantly, and the superficial colonies stain intensely, while the deeper ones are not so markedly stained as those of the Eberth germ.

Effect of temperature. Grows rapidly both at ordinary temperature and at 38° C.

Rate of growth. Rapid.

Relation to air. Grows well under gelatin.

Production of gas. None observed.

Liquefaction. Does not liquefy.

Color. White.

Toxicogenic properties. Toxicogenic in rats, mice, guinea-pigs, and rabbits. See experimental evidence on this point given later.

No. 29. *Bacillus Venenosus Brevis*.

Form. A thick, short bacillus; length about twice the width; grows in threads in old cultures.

Motility. Motile.

Growth:

On gelatin plates. Small, round colonies, with concentric rings. Generally, the deeper colonies are yellowish or brown. The surface colonies are raised, and spread but little. On plates made from the spleen of an inoculated animal the colonies are less regular in outline, and show a marked tendency to spread over the surface.

In gelatin tubes. Grows well along the line and spreads slowly over the surface, but finally extends to the sides of the tube.

On agar. Thin, white growth.

On potato. Moist, light brown, thick growth. Cultures which have been kept for fourteen days or longer at 40° form an invisible growth on potato. The medium used in these experiments was fresh spleen from man.

In Parietti's solution. Grows abundantly.

In Uffelmann's gelatin. Grows slowly, and takes the stain less markedly than does Eberth's germ.

Effect of temperature. Grows both at ordinary temperature and at 38° C.

Rate of growth. Rapid.

Relation to air. Grows well under gelatin.

Production of gas. None observed.

Liquefaction. Does not liquefy.

Color. White.

Toxicogenic properties. Toxicogenic in rats, mice, and guinea-pigs, and rabbits.

No. 30. *Bacillus Venenosus Invisibilis*.

Form. A slender bacillus; length, from two to four times the breadth. Ends are rounded.

Motility. Motile.

Growth:

On gelatin plates. Colonies are small, yellowish, and granular. Surface colonies are very irregular in shape and size, and are coarsely granular.

In gelatin tubes. Grows very slowly both along the line and at the surface; scarcely visible after three days.

On agar. A very thin, white growth.

On potato. On some potatoes the growth is invisible; on others there is a light brown growth.

In Parietti's solution. Grows well.

In Uffelmann's gelatin. Grows well and stains.

Effect of temperature. Grows at ordinary temperature and at 38°.

Rate of growth. Slow.

Production of gas. None observed.

Liquefaction. Does not liquefy.

Color. White.

Toxicogenic properties. Toxicogenic, but in less degree than bacillus *venenosus*. (See inoculation experiments.)

No. 31. *Bacillus Venenosus Liquefaciens*.

Form. A bacillus, whose length is from one and one-half to two times its breadth, and which has rounded ends.

Motility. Motile.

Growth:

On gelatin plates. The superficial colonies are raised, and spread over the surface. The deep colonies are yellowish and finely granular, with unbroken outline.

In gelatin tubes. Grows along the line abundantly, and spreads over the surface slowly. Liquefaction begins after from four to six weeks.

On agar. A thin, white growth.

On potato. A moist, light brown or yellowish growth. When kept for fourteen days or longer on spleen tissue, it forms an invisible growth on potato.

In Parietti's solution. Grows abundantly.

In Uffelmann's gelatin. Grows abundantly and stains deeply.

Effect of temperature. Grows at ordinary temperature and at 38°.

Rate of growth. Rapid.

Relation to air. Grows under gelatin.

Production of gas. Gas bubbles occasionally appear in gelatin tubes.

Liquefaction. Liquefies gelatin after some weeks.

Color. White.

Toxicogenic properties. Toxicogenic to mice, rats, guinea-pigs, and rabbits. (See inoculation experiments.)

The effects of the toxicogenic germs which I have described are compared with those of the Koch-Eberth germ. None of these can be said to be highly toxicogenic to the lower animals. They are not comparable with the germs of anthrax, glanders, tetanus, or diphtheria. I have made a great many inoculation experiments with these germs, but will detail only a few which I have made recently. In my inoculation experiments with Eberth's bacillus, I have used a germ obtained by myself from the spleen of a person dead from typhoid fever, and a germ obtained from the Berlin Hygienic Laboratory. The two sets of inoculations are detailed separately.

RESULTS OF INOCULATIONS.

BACILLUS VENENOSUS.

Experiments 1-5.—Five white rats were inoculated by the injection of two cubic centimetres of an alkaline nuclein¹ culture, twenty-six days old,

¹ The preparation of this medium will be described in a later paper on the chemical products of these germs.

into the abdominal cavity. All died within twenty-four hours. The spleen, kidneys, and liver were found engorged. Plates made from these organs showed abundant growth of the germ in pure culture. Five cubic centimetres of this culture, after being freed from germs by filtration through porcelain, were injected into the abdominal cavities of rats without effect.

Exp. 6-20.—Fifteen white rats were inoculated by the injection of two cubic centimetres of a beef-tea culture, grown for twenty-four hours at a temperature of 38°, into the abdominal cavity. All died within twenty-four hours. The spleen, kidneys, and liver were engorged. Plates made from these organs gave positive results.

Exp. 21-26.—Five white rats were inoculated by the injection into the abdominal cavity of one cubic centimetre of a beef-tea culture, grown for twenty-four hours at 38°. All died within twenty-four hours. Results of the examination and of the plates were the same as those given above. Six cubic centimetres of this culture, after being freed from germs by filtration through porcelain, were injected into the abdominal cavity of rats without effect.

Exp. 27-29.—Three white mice were inoculated by the subcutaneous injection of one cubic centimetre each of nuclein culture six days old. The inoculations were made at 4 P. M. Up to 9 P. M. the animals were apparently unaffected. The next morning they were found with eyes closed, rough coat, refusing to eat, and lying in a stupid state. They remained in this condition throughout the day, and were found dead the next morning, about forty hours after being inoculated. All of these mice suffered from diarrhoea before death. Post-mortem examination showed the intestines containing yellowish, watery feces. No marked changes were observed. Plates were made from the spleen, kidney, and liver of each. All these plates showed pure cultures of the germ.

Exp. 30. A guinea-pig was given two cubic centimetres of a nuclein culture six days old, under the skin of the back. The animal died after forty-eight hours. Examination showed the spleen slightly enlarged, and the intestines filled with watery feces. The animal had marked diarrhoea the day before it died. Plates were made from the spleen, tube cultures from the plates, and potato cultures from the tube. The growths on the potatoes were all less marked than those on companion potatoes made from the tubes of the germ which had not been through an animal.

Exp. 31-33.—Three white rats were given each one cubic centimetre of nuclein culture, six days old, under the skin of the back. The next day all had rough coats and all refused to eat. On the third day after the inoculation one of the rats died. Post-mortem showed the intestines inflamed, and the surface of the liver marked with many white nodules, each of which was about an eighth of an inch in diameter. These spots contained pure cultures of the germ. The spleen, which was engorged, also yielded the germ in large numbers. One of the rats seemed to gradually improve and on the twentieth day it was killed and the kidney, spleen, and liver plated. These plates remained sterile. The third rat developed three large, lymphatic tumors, one in each groin and one in the left axilla. The animal ate its food but still retained its rough coat and became very much emaciated. On the thirtieth day after the inoculation the animal was killed and plates were made from one of these tumors and from the liver, spleen, and kidney. The only abnormality observed in the abdominal organs was the enlargement of the spleen, which was twice as large as normal. A small number of colonies appeared on the plates made from the spleen, while the other plates remained sterile. Tubes were made from the spleen plates and the identity of the germ fully determined. This shows that this bacillus may live in the body of the rat for thirty days. This result I regard as exceptional, and due to the condition of the animal more than to the virulence of the germ.

Exp. 34 and 35.—Injected under the skin of the back of each of two gray mice one cubic centimetre of a twenty-four hours' beef-tea culture. The next day these animals remained in a lethargic condition, and on the following day they died. There was marked congestion of the bloodvessels

of the mesentery and, in one, fecal matter was found in the peritoneal cavity. The spleen, liver, and kidney were dark. Plates made from these organs developed the germ.

Exp. 36 and 37.—Injected under the skin of the back of each of two guinea-pigs two cubic centimetres of a twenty-four hours' beef-tea culture; both had rough coats and ate but little during the next two days. After this one rapidly improved and was soon apparently well. The other gradually lost flesh and died on the twelfth day after inoculation. The only abnormality which could be detected was an enlargement of the spleen, which was at least four times the size of this organ in healthy guinea-pigs. From the spleen, liver, and kidney cultures were made, and on each plate a small number of colonies of the germ appeared. Tube and potato cultures were made from these plates, and a wholly invisible growth formed on the potatoes.

Exp. 38-40.—Inoculated three white rabbits by the injection of three cubic centimetres of an alkaline nuclein culture under the skin of the back. Two of the animals were, so far as could be seen, not affected. The third began, on the second day, to show evidence of a profuse diarrhœa, which continued and was accompanied by great emaciation. The animal continued to eat, and, indeed, it ate more than either of the others, and seemed to have an insatiable appetite. The diarrhœa and emaciation continued for two weeks, and at the expiration of this time it was much reduced, but it continued to eat and soon began to regain flesh. After two weeks more it showed but slight evidence of the previous emaciation.

Exp. 41.—Injected two cubic centimetres of a nuclein culture into the abdominal cavity of a white rabbit about eight weeks old. The next morning the animal had a profuse diarrhœa, and died within forty-eight hours after the inoculation. The spleen was much congested and the small intestines highly inflamed. Plates made from the spleen, liver, and kidney showed abundant germs.

Exp. 42.—Injected two and one-half cubic centimetres of beef-tea culture, seven days old, under the skin on the back of a guinea-pig which had survived a previous inoculation with Eberth's germ. The animal was not affected, so far as could be seen.

BACILLUS VENENOSUS BREVIS.

Exp. 1 and 2.—Injected three cubic centimetres of a beef-tea culture, twenty-four hours old, into the abdominal cavity of each of two large rabbits. Both animals died within thirty hours. The spleen, liver, and mesentery were much congested. Cultures made from the spleen, liver, and kidney showed numerous colonies of the germ.

Exp. 3.—Injected two cubic centimetres of a beef-tea culture into the abdominal cavity of a large rabbit. The animal died within twenty-four hours. The post-mortem appearance and the cultures corresponded with those in the preceding experiments.

Exp. 4.—Injected one and one-half cubic centimetres of a beef-tea culture, twenty-four hours old, into the peritoneal cavity of a large rabbit. The animal rapidly emaciated, and the temperature in the rectum was taken twice a day from the eighth to the seventeenth day after inoculation, and was found to vary from 103° to 104.4°. During this time there was profuse diarrhœa. On the eighteenth day the animal was so weak that it could not stand and it was chloroformed and examined. The following observations made at the examination are given:

1. There was no evidence of suppuration at the point of inoculation or elsewhere.
2. The lower four inches of the small intestines were dark and congested externally, and the lower two inches were entirely denuded of epithelium.
3. The intestines contained a yellowish, frothy fluid.
4. The spleen, liver, and kidney were enlarged and somewhat hardened.
5. Cultures from these organs gave pure cultures of the germ.

Exp. 5.—Fifteen drops of a beef-tea culture were injected into the abdominal cavity of a rat; the animal was found dead the next morning. The spleen, liver, and kidney were congested and cultures from these organs gave positive results.

Exp. 6-10.—Two cubic centimetres of a beef-tea culture were injected under the skin on the back of each of five guinea-pigs. All died within from two to ten days after the inoculation. In all the spleen was found enlarged and cultures from this organ gave positive results.

Exp. 11 and 12.—One cubic centimetre of a beef-tea culture was injected under the skin on the back of each of two white mice; the animals died within forty-eight hours and cultures from spleen, liver, and kidney showed abundant colonies of the germ.

BACILLUS VENENOSUS INVISIBILIS.

Exp. 1-10.—Injected one cubic centimetre of a beef-tea culture into the abdominal cavity of each of ten white rats. All died within forty-hours. The spleen, liver, and kidney were congested and cultures from these organs gave positive results.

Exp. 11-14.—Injected one cubic centimetre of a beef-tea culture, twenty-four hours old, under the skin of the back of each of four white mice. All died on the second day. Cultures from the spleen, liver, and kidney gave positive results.

Exp. 15 and 16.—Injected one and one-half cubic centimetres of a nuclein culture under the skin on the back of each of two guinea-pigs; the animals were not affected.

Exp. 17.—Injected one cubic centimetre of a beef-tea culture under the skin on the back of gray mouse. The animal died within twelve hours and cultures were made from the spleen, liver, and kidney with positive results.

BACILLUS VENENOSUS LIQUEFACIENS.

Exp. 1-3.—Injected one cubic centimetre of a beef-tea culture, twenty-four hours old, under the skin on the back of each of three gray mice. One died within eighteen hours, a second within thirty hours, and the fourth within forty-eight hours. Post-mortem examination in each showed marked engorgement of the mesentery and the spleen. Plates revealed the presence of the germ.

Exp. 4-12.—Injected fifteen drops of a beef-tea culture into the abdominal cavity of each of ten white rats. All died within twenty-four hours. Examinations showed the spleen markedly engorged and the liver and kidney slightly so. Plates from these organs gave positive results. Five cubic centimetres of this culture, after filtration through porcelain, were injected into the abdominal cavity of each of five rats without causing death.

Exp. 13.—Injected three cubic centimetres of a beef-tea culture, seventy-two hours old, into the abdominal cavity of a rabbit. The animal died within twenty-four hours. The spleen was found engorged and cultures showed the presence of the germ.

EBERTH'S GERM (*from spleen*).

Exp. 1.—Injected three cubic centimetres of a beef-tea culture, twenty-four hours old, into the abdominal cavity of a rabbit. The animal died within twenty-four hours.

Exp. 2.—Same as No. 1, except that the animal remained apparently unaffected until the eleventh day, when it was found to be completely paralyzed in the posterior extremities. Two days later the rabbit died. Examination showed the mesenteric glands very much enlarged. The mucous membrane of the small intestine was congested; Peyer's patches enlarged; externally the lower end of the small intestine was covered with a

plastic exudate. Cultures were made from kidney, liver, spleen, and blood, but all the plates remained sterile.

Exp. 3-5.—Injected one cubic centimetre of a beef-tea culture, twenty-four hours old, into the abdominal cavity of each of three white rats. One died after forty hours. The mucous membrane of the lower portion of the small intestine was markedly inflamed. Cultures gave positive results. The other rats were not seriously affected.

Exp. 6-8.—Injected into the abdominal cavity of three white rats, respectively, fifteen, ten, and five drops of a beef-tea culture, twenty-four hours old. The one which had ten drops died within twenty-four hours. The post-mortem appearances were like those of the rat which had one cubic centimetre. The other rats were not affected.

Exp. 9-11.—Injected two cubic centimetres of a beef-tea culture into the abdominal cavity of each of three white rats. Two died within twenty-four hours, in each the lower portion of the small intestine was inflamed internally and covered with a plastic exudate externally. Plates made from the liver, spleen, and kidney, gave positive results. The third rat recovered.

Exp. 12.—Injected one-half cubic centimetre into the abdominal cavity of a white rat. The animal did not appear to be seriously affected. It was killed on the fourth day. The spleen was about three times the normal size. Cultures gave numerous colonies.

Exp. 13.—Injected one cubic centimetre of a beef-tea culture, twenty-four hours old, into the abdominal cavity of a half-grown rabbit. The animal died within twenty-six hours. The mucous membrane of the lower portion of the small intestine was slightly inflamed. No other changes were observed. Plates showed numerous colonies.

Exp. 14.—Injected into the abdominal cavity of a guinea-pig one cubic centimetre of a beef-tea culture, twenty-four hours old. The animal died within twenty-four hours. There was slight redness of the small intestine. Cultures gave positive results.

EBERTH'S BACILLUS (*from Berlin*).

Exp. 1 and 2.—Injected one cubic centimetre of a beef-tea culture, twenty-four hours old, into the abdominal cavity of each of two white rats. One died within twenty-four hours. The lower portion of the small intestine was inflamed, and was covered externally with a plastic exudate. The second rat did not die, but was killed on the fourth day. The spleen was enlarged, but not so markedly as in the rat which had been inoculated with the bacillus from the spleen.

Exp. 3 and 4.—Injected two cubic centimetres of a beef-tea culture, twenty-four hours old, into the abdominal cavity of each of two white rats. One died within twelve hours. The spleen, liver, and kidney were engorged. Plates were successful. The second rat did not appear to be affected by the inoculation.

RELATION OF THESE TOXICOGENIC GERMS TO THE BACILLUS OF EBERTH.

From the studies which I have detailed, the following points seem to me to be demonstrated :

1. In their effects upon the lower animals these toxicogenic germs are fully equal in virulence to the Eberth bacillus.

2. The post-mortem appearances in animals dying after inoculation with these germs, are practically identical with those observed in animals killed by inoculation with the Eberth germ.

3. While the bacillus *venenosus*, as taken from water, forms on potato

a growth wholly different from that of the Eberth bacillus, the former, when taken from animals which have survived the inoculation for twelve days or longer, forms on the potato the invisible growth which is generally supposed by bacteriologists to be characteristic of the Eberth bacillus.

4. Two of these toxicogenic germs form on potatoes invisible growths, when taken from cultures in human spleen which have been kept at a fever temperature for some days.

5. The fourth toxicogenic germ, when taken directly from the water, forms an invisible growth on potato.

If we add to these the fact, well known to bacteriologists, that there are marked morphological and culture differences between Eberth germs from spleens in different epidemics of typhoid fever, and that the most skilful bacteriologists have reported most diversely upon the reaction of the Eberth germ with staining reagents, the evidence becomes sufficient to convince me that the Eberth germ, as found in the spleens and other organs after death, is not a specific microörganism, but is a modified or involution form of any one of a number of related germs. (I have refrained from discussing the reaction of the Eberth germ with staining reagents in this paper because I have elsewhere gone quite thoroughly into this point of controversy.)

If we cannot agree in this conclusion, we must accept the view of Babes, that there are varieties of the Eberth bacillus. It probably makes but little difference whether we conclude that these germs are varieties of one species or that they are related species. I know of no hard and fast lines upon which one can decide, to the satisfaction of everyone else, whether two or more germs, differing more or less, should be classified as species or as varieties.

Of one thing I am certain, and that is that I am ignorant of any crucial test, or of any combination of tests, upon the strength of which I can say at present that a germ which I may find in drinking-water is identical with the so-called typhoid bacillus. I have found in spleens after death from typhoid fever, germs which differ from the typhoid bacillus obtained from Berlin, and from one another as markedly as my bacillus *venenosus* differs from either or both.

REVIEWS.

REPORT ON CHOLERA IN EUROPE AND INDIA. By EDWARD O. SHAKESPEARE, A.M., M.D., Ph.D., United States Commissioner. Washington: Government Printing Office, 1890.

IN the selection of a Government representative, political expediency is usually the guiding consideration, and the same is unfortunately true in the smaller sphere of medical politics. Nevertheless, the right man now and then obtains the right place, either because his abilities are so conspicuous as to make detraction ridiculous and opposition futile, or from the force of circumstances apparently fortuitous.

There was nothing fortuitous in Dr. Shakespeare's appointment "as a representative of the Government of the United States, to proceed under the direction of the Secretary of State, to Spain and such other countries of Europe where the cholera exists, and make investigation of the causes, progress, and proper prevention and cure of the said disease." . . . Before bacteriology was regarded as a science, his reputation as a pathologist was thoroughly established, and he was among the first to recognize the fundamental relations of microorganisms to disease, and to familiarize himself with the technique of their study. He carried with him on his mission the confidence of the entire profession, and that it was not misplaced is proved by the Report now before us.

The book is a storehouse of information on all relating to cholera, and will always be consulted as a standard authority by the hygienist, the statistician, the bacteriologist, and the medical practitioner.

The author's method of arranging and classifying the details of his vast subject is an admirable one. He begins by studying the course of the cholera epidemic immediately preceding the one which he personally investigated, describes its introduction into Egypt, and its prevalence throughout that country in 1883, and treats in detail of the sanitary conditions there prevailing. He next traces the disease to France, Italy, Spain, and other European countries, and finally, to the port of New York, which it reached on September 23, 1887. In the numerous sections of this chapter of 370 pages, elaborate details are given of the sanitary conditions of the towns in which the epidemic was rife.

Chapter II. deals with the topography and demography of British East India in relation to cholera, and is, from the vitally important standpoint of prophylaxis, the most important part of the Report. It contains a most emphatic denunciation of the criminal negligence which permits the periodic migration of cholera, in company with the Mohammedan pilgrims to Mecca, from the port of Bombay.

India is universally acknowledged to be the home of cholera, and after reading Dr. Shakespeare's description of the filthy habits of the Hindoos, it is easily understood why this is the case. Until this immense focus of

infection is sterilized it is a constant menace to the world, the various governments of which have the right to demand what measures to accomplish this end are being carried out by the Government of India. According to Dr. Shakespeare, they are absolutely futile; they can, he says, "never accomplish it, so long as the present customs of caste and modes of life of the inhabitants prevail." In fact, according to this Report, the Government of India is inclined to repress too zealous efforts at sanitary reform, as is evidenced by the fact that Dr. Simpson, the health officer of Calcutta, was publicly reprimanded for pointing out the "filthy sanitary condition of the native population of Calcutta, and the urgent necessity for prompt and radical reforms."

Chapter III., which is entitled "Bacteriological Investigations and Literature," is a compilation of the principal literature concerning the comma bacillus, and contains papers by Koch, Klein and Gibbes, Cheyne, Nicoti and Rietsch, Klebs and Ceci, Ferrán, and many others. The Stillé of the next generation, if it produces one, will find here, ready to his hand, all the materials for continuing the history of cholera.

Chapter IV. treats of the etiology of cholera and its differential diagnosis from malaria, and contains the author's personal observations concerning the etiology of Asiatic cholera. The result of the latter has forced him to admit that the "claim made by Koch must be regarded as established, namely, that the presence of his comma bacillus in the alvine evacuations, or the intestinal contents, or vomit of an individual suffering with a suspicious attack, furnishes a ready, safe, and absolutely reliable means of diagnosis of Asiatic cholera."

The importance of the discovery of an organism peculiar to cholera is incalculable, for, as pointed out in connection with the introduction of cholera into France and Spain, valuable time has been wasted in the beginning of all epidemics in discussing the nature of the disease.

This chapter contains a digression from the subject of cholera which, on superficial examination, seems unwarranted. I refer to the section on malaria, with its beautiful illustrations of the hæmatozoön malarie in its various transformations. When, however, it is ascertained by more careful reading that the sanitary commissioner of the port of Bombay—the port from which cholera accompanies the Mohammedan pilgrims to Mecca—has pronounced cholera to be only a pernicious form of malaria, and neither transportable nor contagious, it becomes evident that he and others in India holding such views should be instructed in the means of distinguishing between cholera and the malarial fevers.

The question of immunity is discussed in Chapter V., and forms an appropriate introduction to preventive inoculation, which is the subject of Chapter VI. Griesinger, Colin, Proust, Koch, and others, are quoted in favor of the view that one attack of Asiatic cholera confers at least a short immunity from subsequent attacks. While in Spain, Dr. Shakespeare prepared a circular letter containing twenty-five questions concerning the etiology, nature, and prophylaxis of cholera, one of which requested the physician to state whether he was acquainted with instances of second or third attacks of cholera during the same epidemic. This circular was sent to about twenty-five hundred physicians residing in the cities, towns, and villages which had suffered from the epidemic. Among the "large number" of replies (the number is not mentioned) there were only eight in which a second attack was reported, and "from an examination of the details of these there was no doubt left in our mind that six

were not second genuine attacks after a complete recovery, but were in reality relapses due to imprudences of diet or otherwise, before convalescence and complete recovery had been established."

The fact of immunity being conferred by an attack of cholera is, however, better supported by a number of charts which show the periodic recurrence of cholera epidemics. This periodicity is especially marked outside of the regions where cholera is endemic, viz., in Bengal and Assam. The periodical recurrences of cholera in India bear a striking resemblance to those of smallpox, of which graphic charts are also given, "the immunity seeming to be more or less positive for from two to five years."

Chapter V. is partly devoted to a defence of Dr. Jaime Ferrán, of Tortosa, and an investigation of his method of preventive inoculation. Dr. Shakespeare, like many others, had been prejudiced against Dr. Ferrán by publications in the medical and secular press, and had besides been told by those whose opinions in other matters he valued, that the Ferrán question was unworthy of serious consideration. It was this very abuse of the man which decided Dr. Shakespeare to visit him in his own home and investigate his methods, and there is no incident in the course of his extensive travels which so thoroughly exhibits the manly spirit in which the work of our Commissioner was performed. The account of the interview with Ferrán is most interesting; suffice it to say that Dr. Shakespeare left Tortosa "with a very different opinion concerning the character and accomplishments of Dr. Ferrán" than he had entertained before making his visit to that city.

The claims of Ferrán are thoroughly investigated and, it is needless to say, with characteristic impartiality. The result is "the belief that subcutaneous inoculations into man of pure liquid cultures of the comma bacillus of Koch, whilst they do not usually excite disturbances which in any way resemble Asiatic cholera, apparently exercise a certain protective influence through the establishment of a considerable degree of immunity from attack and death by cholera."

Chapter VII. deals with measures of prevention, general and individual, and contains an elaborate argument in favor of national control of maritime quarantine.

The last chapter of this colossal work deals with the etiology, pathology, symptomatology, prognosis, and treatment of cholera, and has for the most part already appeared in Keating's *Cyclopædia of the Diseases of Children*. It contains in a few pages those facts concerning the disease which are of the greatest interest to the practitioner.

The above remarks may serve to convey an idea of the nature of this Report, the value of which depends, not so much upon its stupendous array of facts as upon their judicious selection and arrangement, and the critical remarks by which they are accompanied.

The unflinching zeal displayed by Dr. Shakespeare in the prosecution of this research is worthy of the highest commendation. No considerations of personal convenience or safety seem to have entered his mind. For example, he spent the summer months in India, and during one of them was prostrated by illness, and, as is well known to the physicians of Philadelphia, he returned to that city with health so shattered that it was many months before he could begin the arduous work of his Report. The delay in its publication was keenly felt, but solely because all were anxious to see what all knew would be a masterpiece.

CLINIQUE DES MALADIES DU SYSTÈME NERVEUX—M. LE PROFESSEUR CHARCOT. Leçons du Professeur, Mémoires, Notes et Observations, pendant les années 1889-90 et 1890-91, et publiés sous la direction de Georges Guinon, Chef de Clinique. Tome I. Paris, 1892.

CLINICAL LECTURES ON DISEASES OF THE NERVOUS SYSTEM. By PROFESSOR CHARCOT, etc. Paris, 1892.

THE appearance of a new book from Charcot's clinic is a conspicuous event. From no other source does the medical world expect so much and such perfect and attractive clinical work in the field that the author has made his own; and it is rarely disappointed. This volume is a collection of Charcot's more important lectures, delivered during the last two years, and of notes and observations by his assistants and students at the Salpêtrière. It is a notable book. It contains much that is new; and some that is even not entirely new gains a freshness and vigor, and acquires an individuality and importance, that Charcot knows well how to impart. In his preface he says that such a collection may be useful to those who are interested in the facts of neuro-pathology. But it is more than useful—it is indispensable. It will be received with satisfaction as a continuation of the author's great treatise on *Diseases of the Nervous System*; and the periodical appearance in the future of similar volumes, pioneers doubtless in a progressive neurology, will be of the first importance.

The book contains too much to be noticed here in detail. We shall select only the more important subjects.

Morvan's disease is discussed at length. First described in 1883 by Morvan, of Lannilis, who called it "analgesic paralysis of the upper limbs, with whitlow," its autonomy is still disputed by some. Charcot distinguishes it from scleroderma of the finger, from anæsthetic leprosy, and from Reynaud's disease. It has three predominant symptoms: (1) Pain. (2) Paralysis with analgesia of one side, then of the other. (3) Whitlows. The paralysis and anæsthesia sometimes precede the pain. Other trophic disorders may appear. The "dissociation symptom" of syringomyelia, *i. e.*, the preservation of tactile sensation with abolition of the pain and temperature senses, is not observed—at least Morvan claimed that it was not observed, and this is considered by some to distinguish the disease from gliomatosis of the cord, or syringomyelia. The whitlow begins like a common felon, with redness, heat, and swelling, but it is always a grave complication, destroying the distal phalanges and sometimes even those next. Occasionally a scoliosis of the spine is observed. The duration of the disease is long, its prognosis is grave, and its etiology is almost unknown. Morvan believed that its seat is in the cord at the origin of the brachial nerves. The first autopsy showed no cavities in the cord, but only a sclerosis. In a later lecture, however, Charcot reviews the subject again, and concludes that Morvan's disease is only a special type of syringomyelia.¹

Hysterical tremors are described in an elaborate essay. They are classified, as is the French mode, and presented in groups. This makes

¹ *Vide* Leçon No. XII., "Sur un cas de Syringomyélie avec Panaris analgésiques—type Morvan" (p. 243).

the study of them easy and attractive, but does not avoid the suspicion that perhaps they are not so nicely differentiated in nature. It is remarkable, as Charcot says, that this part of the symptomatology of hysteria has been so much neglected. Even the work of Briquet, so complete in other respects, has but an allusion to tremor. To Rendu and a few other recent French writers all the credit is given of "opening a new era" by describing the various types of this symptom. As is too common among his countrymen, Charcot does scant justice here to American writers. Mitchell, years ago, although he abstained from classification, discussed the tremor of hysteria in his well-known monograph. Charcot contends that hysteria simulates all the tremors of organic origin, and, accordingly, divides the hysterical tremors into groups simulating the tremor respectively of paralysis agitans, exophthalmic goitre, alcoholic and general paralysis, disseminated sclerosis, and mercurial poisoning. The association of the tremor, of whatever type, with hysterical stigmata; the relation of trauma to hysterical tremor; the possible identity of this tremor and that of mercurial poisoning, are among the important subjects discussed and elucidated.

Migraine appears to be one of the most varied of nervous diseases. Charcot adds to our knowledge of it, the description of a type of rare interest. He calls it *migraine ophthalmoplégique*. This form of migraine is accompanied by a paralysis of the oculo-motor nerve, involving the branches to both the exterior and interior muscles of the eye. Therefore the syndrome is an almost complete ophthalmoplegia, externa and interna, involving the iris and ciliary muscle as well as the muscles of the eyeball supplied by the third nerve. The fourth and sixth nerves apparently escape. This ophthalmoplegia follows a paroxysm of pain and vomiting, identical with that of the classical migraine. The eye may be congested; ophthalmoscopic examination gives negative results. The author makes valuable historical notes and references.

Charcot reports, and studies carefully, two cases of muscular atrophy associated with ophthalmoplegia externa. This combination is exceedingly rare, and depends upon degeneration of the nuclei, in the mid-brain, of the motor nerves to the orbit, identical and synchronous with the degeneration of the motor nuclei in the anterior horns in the cord. This syndrome, ophthalmoplegia externa, or nuclear ophthalmoplegia, interests the general clinician more directly even than the ophthalmologists, who almost exclusively have studied it. Hutchinson first described it fully and gave it the present name, which ought to be slightly changed, as Mauthner suggests, so as to be read "exterior" rather than "externa." It means, of course, a paralysis *not* of the extensor muscle only, but of all the exterior muscles of the eye, as well as of the elevator of the upper lid, as distinguished from the interior muscles—the iris and the ciliary muscle—which escape. Several disease-processes may cause this complexus of symptoms. Tumor of the mid-brain is one, although in our observation this is likely to involve the nerves to the iris and the ciliary muscle. Certain acute inflammatory or destructive processes, as alcoholism and diphtheria, may cause complete or partial ophthalmoplegia, as Wernicke and others have shown. It may appear with locomotor ataxia and general paresis. Finally, as Charcot shows in his present lecture, ophthalmoplegia externa may be combined with a more or less general muscular atrophy, either subacute, or slow and progressive. He suggests that this impairment of the mid-brain be

called superior bulbar paralysis, in contradistinction to the commonly observed, or *inferior*, bulbar paralysis. From both the historical and clinical standpoints this lecture is very full and instructive.

In another lecture Charcot discusses the relation of diabetes to diseases of the nervous system, and describes especially diabetic paraplegia. This is apparently a peripheral neuritis, very similar to the pseudo-tabes caused by alcohol and lead. It is marked by fulgurant pains, dysæsthesiæ, abolition of the knee-jerks, swaying, and an altered gait. The author protests that this gait, in both diabetic and alcoholic paraplegia, should not be called *ataxic*. It is a true *démarche de stepper*, not an ataxia, and is caused by paralysis of the extensor muscles and consequent falling of the foot. Hence the patient has a high-stepping gait. Charcot, as usual, makes interesting historical observations, and calls attention to the fact that whereas originally, owing to the brilliant experiments of Bernard, diabetes was believed to be caused always by a lesion of the floor of the fourth ventricle, hence to be primarily a nerve-lesion, it is in comparatively recent days that the importance of nerve-lesions secondary to diabetes has been recognized.

We have reviewed this valuable book at sufficient length. Many other subjects, equally attractive and suggestive, are presented in a series of lectures each of which is a monograph. These products of this noted contemporary clinic, presented with the literary skill of a master, need no commendation nor even this brief introduction to studious readers, who will appreciate them well.

J. H. L.

DISEASES OF THE EYE. A HANDBOOK OF OPHTHALMIC PRACTICE FOR STUDENTS AND PRACTITIONERS. By G. E. DE SCHWEINITZ, M.D., Professor of Diseases of the Eye and Ear in the Philadelphia Polyclinic; Lecturer on Medical Ophthalmoscopy in the University of Pennsylvania, etc. With two hundred and sixteen illustrations and two chromo-lithographic plates. Pp. 641. Philadelphia: W. B. Saunders. 1892.

WHEN this book came to our attention we said, Surely the assertion of the wise man of old, Solomon, is right—"Of making many books there is no end." In the past five years we have had as many volumes on this well-worn subject, with but little new matter. It is too much the practice for teachers in medical schools to write books for no other reason than that the students of their school or college will read them.

We have here not only the experience of Dr. de Schweinitz, in the parts relating to the diseases of the eye, but the experience and style of Dr. James Wallace, of the University Hospital, in those relating to the optical principles, refraction, and the like; and the aid of Dr. Edward Jackson on the subject of retinoscopy—for what reason does not appear.

The volume contains twenty-two chapters, a bibliography, and an index. Chapter I., by James Wallace, M.D., treats of "General Optical Principles," and contains fifty-six pages, with the usual illustrations. The question of the *centrad* and *prism-dioptre*, as applied to prisms, is gone into, and a table gives their relative values. We quite agree with the writer that this new method of designating prisms is of value, especially in determining the prismatic deviation of a decentred lens: if a lens

be decentred one centimetre, the prismatic deviation of the lens will be equal to as many prism-dioptres as the number of dioptres in the lens.

Chapter II. is on "External Examinations of the Eye." The treatment of "balance of the external eye muscles" is most clearly and concisely written, and no one can fail to find profit in reading it.

Chapter III., "Reflection, the Ophthalmoscope, and the Theory of Ophthalmoscopy and Retinoscopy," consists of forty-six pages, with the usual illustrations. And, strange to say, the author does not present any particular form of ophthalmoscope which he prefers, and to which he has added some peculiar wheel or cog, as is usually the case in recent books on this subject. We congratulate the writer on his being satisfied with the instruments now at our disposal.

"Ophthalmometry" is mentioned in a few words; we should judge that our Philadelphia brothers are not as enthusiastic over its usefulness as are those of a neighboring city. Retinoscopy is treated of by Dr. Jackson in a very clear and plain manner. We agree with him as to its usefulness and ease of application.

Chapter IV., "Normal and Abnormal Refraction," by James Wallace, M.D., takes fifty pages, but we find nothing new nor any plainer exposition of facts for the student. Dr. Jackson's tables showing the amount of deviation which is produced by decentring a spherical lens are useful, and close the chapter.

In the section on "Diseases of the Conjunctiva," we are sorry to see the terms "chronic," "military," and "toxic ophthalmia," when the word *conjunctivitis* should be used.

Chapter XII., on "Glaucoma," is concise and perfect, giving all methods of treatment to date. We think, however, that many cases of acute glaucoma may be cut short and permanently relieved by sulphate of eserine; the author speaks of it rather as a temporary agent.

The chapters on the diseases of the interior of the globe are all excellent and the teaching sound. Space forbids more extended mention.

Chapter XIX., "Movements of the Eyeballs and Other Anomalies," is one of the best in the volume, and, in point of original matter and illustration, to our mind takes the lead of the previous chapters in practical and lucid demonstration.

We agree with the author that the adoption of the nomenclature of Dr. Stevens is a more convenient manner of describing weakness of muscular action than the old method; this is perfectly consistent, and at the same time does not commit the author to any of Dr. Stevens's theories as to etiology of nervous affections, etc.

Chapter XXII. describes the operations upon the eye and its appendages, in about fifty pages, with numerous illustrations.

The directions as to the preparation of the hands of the operator, the patient, and the instruments will suit the most fastidious believer in antiseptic surgery.

All that is said about the extraction of cataract is good and sound, only we wish the author would express his own views of preference rather than those of another. Partial and graduated tenotomy is mentioned without comment of condemnation or praise. We should have been pleased to have seen it omitted, as we consider the method as described in the text, and as we have seen it performed, unscientific.

Taken as a whole, the volume just closed is a good, sound, and concise record of the facts known to ophthalmic science, given in a plain

manner and without comment: this, to our mind, is the principal fault. Many of the plates are fair, but we must confess to a feeling of disappointment, as in these days of photography certainly better results should be obtained.

The publishers have done their work well, and in conclusion we can wish the volume a large sale and field of usefulness. W. O. M.

THE TREATMENT OF TYPHOID FEVER; AND REPORTS OF FIFTY-FIVE CONSECUTIVE CASES WITH ONLY ONE DEATH. By JAMES BARR, M.D., Physician to the Northern Hospital, Liverpool, etc. With an introduction by W. T. GAIRDNER, Professor of Medicine in the University of Glasgow, etc. 8vo., pp. 212. London: H. K. Lewis. 1892.

THIS book derives interest from a well-written historical sketch of the treatment of the continued fevers from the time of Sydenham, and an account of the author's method of treating typhoid fever. The historical sketch runs in somewhat narrow lines, and chiefly refers to the work done by British physicians. The author's method of treating his severe cases of enteric fever, as carried out in the Northern Hospital of Liverpool, certainly marks a new departure in the management of this disease. It consists in the use of the tank as a means for continuous immersion, as introduced in 1861 by Hebra for the treatment of burns, scalds, psoriasis, and other extensive lesions of the skin.

The author's tank consists of a wooden box, six feet long, two feet ten inches wide, and sixteen inches deep. It is lined with lead, painted, and covered with a thick coat of shellac. It is provided with a large discharge-pipe communicating with a soil-pipe leading down to the sewer. It is capable of holding seventy gallons of water and of being emptied in three minutes. There is hot- and cold-water connection. The patient's body rests upon a sheet of bed-ticking, stretched at a level which enables the patient to be submerged, with a strip about a foot wide for the head, which rests upon an air-pillow, "so as to keep the head above water, which is a most essential matter in most conditions of human life." The patient, wrapped in a blanket, is thus submerged. The tank is covered with a half-lid. The author suggests that the tank might easily be provided with a small circulating boiler to maintain a uniform temperature, but that this is unnecessary, as by the removal of a quantity of water and the addition of hot water at intervals a sufficiently equable temperature may be maintained. A thermometer is kept constantly in the tank. The water is kept at a temperature varying from 90° to 98° F. Further points of treatment are given in sufficient detail. Full notes of twenty-two cases treated by this method are appended. Of these cases one only terminated fatally. The histories of a number of other cases treated by the expectant-symptomatic plan, and general observations on diagnosis and prognosis, make up the body of the book.

The author regards his plan of treating enteric fever by continuous immersion as simply a modification of and an improvement upon the method of treating this disease by systematic cold baths originated by Brand.

In this opinion we cannot concur. The action of the continuous bath is essentially different from that of the cold bath given regularly at intervals of three hours so long as the temperature continues to rise above 102° F.

The stimulus to the respiratory centres, to the circulation, to the skin, produced by the sudden immersion in cold water; the abstraction of heat resulting from the continuous agitation of the water in contact with the surface produced by briskly rubbing the patient's skin during the bath; the favorable influence upon the peripheral circulation brought about by warm blankets and alcohol after the bath, and the rhythmical repetition of these influences, constitute a therapeutic procedure totally differing in every respect from that of continuous immersion. It is to these rhythmical alternations of influences upon the nervous system as well as to its distinct antipyretic working that the beneficial effects of the method of systematic cold bathing are attributed by Brand and his followers.

Dr. Barr's method, ingenious and bold as it is, has been followed by good results in this first series of cases. Should these favorable results continue in larger series in the future he will doubtless be followed elsewhere, with the result of finally determining the value of the plan.

J. C. W.

THE PATHOLOGY AND TREATMENT OF GLAUCOMA. By PRIESTLEY SMITH, Ophthalmic Surgeon and Clinical Lecturer on Diseases of the Eye, Queen's Hospital, Birmingham, etc. London: J. & A. Churchill. 1891.

THIS work of 200 pages is a revised and enlarged edition of the Erasmus Wilson Lectures delivered before the College of Surgeons of England, in March, 1889, which, when first published, established the reputation of the author as an authority on glaucoma. It is a record of numerous painstaking and careful physiological experiments, with their results, as well as a statement of deductions drawn from the examination and analysis of many pathological specimens.

Lecture I. discusses physiology exclusively, and the methods of estimating tension of the eyeball by palpation and by instruments invented for the purpose. Experiments of Mr. Smith and those of other well-known physiologists determine the following important facts: "That the fluids which nourish the vitreous body and the lens and fill the aqueous chamber are secreted chiefly by the ciliary portion of the uveal tract; that the larger portion of the secretion passes directly into the aqueous chamber, forward through the pupil, and out at the filtration angle; a very much smaller portion passes backward through the vitreous body and escapes at the papilla; and that the hyaloid membrane is readily permeable by the vitreous fluid."

Lecture II. considers the causes and conditions of increased intra-ocular tension—among them are hypersecretion, serosity of fluids, and obstruction of the filtration angle. As proof of the last, the author cites as accepted causes of secondary glaucoma, annular posterior synechiæ, perforating wounds and ulcers of the cornea, with anterior synechiæ, dislocation and swelling of the lens through injuries, operations, and intra-ocular tumors: in all these the angle becomes closed.

Lecture III. considers in detail the predisposing causes of idiopathic or primary glaucoma: 1. The disposition of the lens to increase in size from ten years to seventy, disproportionately to the increase in growth of the ball. Thus "between twenty-five and sixty-five years of age it adds one-third to its weight, one-third to its volume, and one-tenth to its diameters." 2. The liability to glaucoma increases proportionately with the age. This is demonstrated by a series of tables in the appendix. 3. The liability is greatest in small eyes. The author demonstrates this proposition by measurements taken from a moderately large number of healthy and glaucomatous eyes and classified into tables, as well as by photographs of normal and abnormal specimens which had been subjected to similar methods of preparation, and claims that in each of the glaucomatous eyes were found a small globe, a disproportionately large lens, a shallow anterior chamber, a closed filtration angle, an atrophied ciliary body, and an excavated optic nerve.

Among the exciting causes of this form of glaucoma he mentions congestion and inflammation of the uveal tract as caused by exposure, constipation, hunger, sleeplessness, bodily and mental fatigue, mydriatics, etc.

An enumeration of the most common symptoms follows, with a short explanation of the manner of their production. In discussing the treatment, eserine and cocaine in combination are mentioned as an effective means in the "initial" stage "to ward off an attack"—the former to contract the pupil, the latter to contract the vessels of the ciliary body and iris. Sclerotomy he admits to be useful at times, but inferior to the proper operative treatment—iridectomy. His theory of the effectiveness of iridectomy is that the closure of the filtration angle is substituted for the permanent filtration in the neighborhood of the cicatrix, aided immediately after the incision by the escape of the aqueous, relief to circulation by the removal of pressure and simultaneous advance of the lens, escape of blood and draining of fluid from the anterior chamber.

In the appendix are tables of classification of 1000 cases, in relation to age, sex, and measurements of crystalline lenses. The last pages describe the methods of preparing and examining specimens.

It must be remembered by the reader of this work that it is not a monograph or a text-book on the subject of glaucoma, and that it does not pretend to deal exhaustively with the subject. Its theme is limited to a consideration of the pathology and treatment. Notwithstanding that the reviewer has borne this fact constantly in mind, he must confess to a feeling of disappointment. The original investigations, which are described at too great length, seem to have been undertaken with the definite object of proving certain theories which had already found a firm footing in the investigator's mind, and the author has accorded too little space to experiments and results which do not tend to confirm his opinions. He has succeeded in demonstrating, for instance, that closure of the filtration angle, upon which he lays the greatest stress, occurs nearly constantly in glaucoma; but other investigators are not convinced that it is the cause, considering it rather the effect, of the glaucomatous process. On the other hand, while there is nothing new or startling, the material is well arranged and the ideas are clothed with fitting phraseology, and are of sufficient importance to warrant the attention of students of ophthalmic science.

The publisher should be credited with the excellence of the mechanical details and the absence of all typographical errors. H. F. H.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

NOTE ON CODEINE SULPHATE.

MR. JOSEPH W. ENGLAND makes mention of the fact that this remedy is an extremely prompt sedative in affections of the respiratory tract, possessing an advantage over morphine in that it does not check the secretions, nor does it lead to a habit, nor has it disagreeable after-effects. It will indeed alleviate pain. The dose varies from one-eighth to one-half, and exceptionally, one grain, given in pill or in solution, frequently in syrup of wild cherry. The officinal alkaloid is rarely used, the sulphate being more frequently prescribed. If administered in water an insoluble residue is sometimes found, which, on examination, was proved to be the alkaloid codeine found in codeine sulphate from the excessive heat employed in concentration of the solution for crystallization.—*American Journal of Pharmacy*, 1892, No. 3, p. 120.

THE TREATMENT OF BASEDOW'S DISEASE.

DR. F. DÉLÉAGE, for the paroxysms of oppression and palpitation applies ice to the precordial region, and administers digitalis, two and a half grains of the dried leaves, every half-hour for two or three hours. If relief is not obtained before the expiration of three hours, a phlebotomy is indicated. Mentioning the treatment as proposed by Cheadle—tincture of iodine internally, the three bromides, digitalis, belladonna; by Sée—veratrum viride, hydrotherapy, electricity; by Dieulafoy—ipecac, digitalis, and opium, he states that the last method seems to yield very satisfactory results. One-half grain of powdered ipecac, one-third of a grain of powdered leaves of digitalis, and one-sixth of a grain of extract of opium for each pill, of which the daily dosage is four to six. The improvement is usually rapid, the only inconvenience being a diarrhœa.—*Revue de Thérapeutique Générale et Thermale*, 1892, No. 7, p. 97.

PHENOCOLL HYDROCHLORIDE.

DR. PAUL COHNHEIM reports a very carefully conducted series of observations. As an antipyretic, a considerable effect was obtained from four grains; the largest single dose was fifteen, the largest daily dose, seventy grains. In hectic, a seven-grain dose reduced the fever from two to four degrees; hence he concludes that it is equal to the more important antipyretics. In his cases it appeared to have no unfavorable action, nor to give rise to exanthemata. As an analgesic it failed in hysteria, in which other anti-neuralgic remedies and narcotics had failed. As an anti-rheumatic it was successful in acute, but failed in chronic articular rheumatism. In asthma there was no result.—*Therapeutische Monatshefte*, 1892, i., S. 15.

SOLANINE.

DR. CH. ELOY calls attention to the recent paper of Desnos and to the fact that this is not at all a new remedy, but since its discovery by Desfosses in 1820 it has been the subject of study by Majendie, Husemann, and others. Formula, $C_{42}H_{87}NO_{13}$, crystalline, of bitter taste, insoluble in water, slightly soluble in alcohol; these characters are, indeed, well known. It is useful as a sedative of both the sensory and of the motor system. It has been used to combat the trembling in sclerosis *en plaques*, in tic douloureux, paralysis agitans, and post-hemiplegic hemi-athetosis. It is supposed to be a moderator of the motor excitation of the bulbo-medullary centre, of the lateral column, and of the pyramidal tract. It has been unsuccessfully administered in whooping-cough. Of late it has been recommended in the pains of dyspepsia, in gastralgia, in the pains of alcoholic gastritis, in gastric ulcer, and to avoid, in certain susceptible classes, the dangers of the morphine habit. The dose is from one to six grains per day in wafers, pills, or mucilage. In spite of the enthusiasm of recent writers, it is not likely that this remedy will come into extended use, because the place which it would seem that it should occupy is already filled by reliable remedies.—*Revue Générale de Clinique et de Thérapeutique*, 1892, No. 14, p. 217.

THE TREATMENT OF EPILEPSY.

DR. GUY HINSDALE has shown from his clinical observations that potassium bromate shares with the bromides the power of controlling epileptic seizures, but it is an irritant intestinal poison, lowering the pulse and depressing the heart to such a degree that in most instances it had to be abandoned. Magnesium bromide exerted an undoubted power in controlling the attacks, both as to frequency and severity; there was, however, apparently a greater liability to facial eruption than in the case of potassium or sodium bromide, and Fowler's solution of arsenic was usually given in addition. Hydrobromic acid was fairly successful; it is not likely to cause acne nor muscular depression, and, in some cases, it is usefully added to lessened doses of alkaline bromides. Certainly, in some instances, it does aid digestion or at least has no tendency to impair that function. The use of nitro-glycerin has not

been sufficiently encouraging to insure its continuance. In some cases, when the improvement was most striking at first, the attacks soon returned, and the remedy had to be abandoned. Nitrite of potassium proved too depressing and produced marked cardiac irritability. Antifebrin succeeded in keeping the attacks, in one case in which the bromides had failed, down to such a number that life was useful, but usually only temporary improvement was noted, and in a few weeks it was necessary to return to the bromides. Sulphonal was used in several cases with more or less unsatisfactory results, and appears to answer admirably as a substitute when the bromides have to be discontinued on account of bromism or other disagreeable complications. He has used sodium biborate, lithium biborate, tincture of cannabis indica, tincture of digitalis, ammoniated copper, and antipyrin, but none of these remedies maintained themselves. He has fallen back, then, upon the bromides of sodium, potassium, and lithium, employing most frequently the sodium salt, which is well borne for long periods, when arsenic is used occasionally to check cutaneous disturbances.—*International Medical Magazine*, March, 1892.

ACTÆA RACEMOSA IN DYSMENORRHOEA AND OVARIAN IRRITATION.

MR. JAMES BRUNTON uses this remedy in twenty to thirty minim doses, thrice daily, for four days previous to the usual time of the appearance of the flow. It is supposed to have an anodyne action upon the dysmenorrhœa, whether of uterine or ovarian origin, and in certain cases of metrorrhagia it can replace ergot to advantage. In amenorrhœa of early girlhood it is of benefit when combined with iron. As an anodyne it can replace the bromides and opiates. In menorrhagia and metrorrhagia it is beneficial as a regulating agent, although at times it is disappointing.—*The Practitioner*, 1892, No. 286, p. 625.

THE TREATMENT OF HEPATIC COLIC BY GLYCERIN.

DR. FERRAND has reported a number of observations which show the advantages of glycerin over oil in the treatment of hepatic colic. It is a cholagogue of itself, and can be more easily administered, and is better tolerated, even to daily doses of an ounce. Administered with the same quantity of chloroform water it is better borne, and, as well, more efficacious. In the intervals it should be given in smaller doses, one to three teaspoonsful in one-half glass of alkaline water, as, for example, in Vichy. He concludes that when administered by the stomach it is absorbed by the lymphatics; it is a powerful cholagogue; a massive dose of one ounce will determine the crisis; a moderate dose of one to four teaspoonsful in an alkaline water will prevent fresh attacks; without being a solvent for calculus, it is a valuable remedy for cholelithiasis.—*Les Nouveaux Remèdes*, 1892, No. 7, p. 147.

THE THERAPEUTIC ACTION OF KOLA.

DR. F. COMBEMALE presents an exhaustive study of this remedy, which contains 2.348 per cent. of caffeine (Heckel and Schlagdenhauffen). Dujardin-Beaumetz has used it with good results in cardiac asystolia; Huchard

believes it to be valuable in cardiac diseases when there is weakness of the myocardium ; it is certainly useful, in the diseases of the heart, as a diuretic. As Fonssagrives has pointed out, this is a true tonic, not only so far as concerns muscular effort, but as well, intellectual work. It may replace quinine in adynamic diseases and can be associated with alcohol in the treatment of infectious diseases. It is valuable in neurasthenia, and in convalescence from epidemic influenza. Firth believes it to be of the greatest value in treating alcoholism. Hamilton asserts that it is a remedy against certain symptoms of sea-sickness (depression, vomiting, vertigo). Chambord-Hénin has used it with brilliant success in a case of confinement, when it prevented syncope. It can be administered as a tincture or a fluid extract, with equal parts of the same preparation of coca. According to Huchard, thirty drops three or four times daily, but not at night, because of the insomnia which it causes.—*Bulletin Général de Thérapeutique*, 1892, 8e. liv., p. 145.

ACUTE POISONING BY PHENIC ACID.

DR. COUTEAUD reports two fatal cases. He considers the result to be due :
 1. To traumatic shock from severe pain arising from the burning of large visceral surfaces ; this pain undoubtedly increased by the imminence of death. 2. To a condition of syncope and the phenomena of inhibition, which are due to respiratory paralysis (at least in part), gastric paralysis, and indeed in one case to bulbar paralysis. 3. To a diffusion of the poison into the blood, preventing the oxidization of the corpuscles, giving to the nervous centres a pathological blood. 4. To asphyxia, such as above-mentioned, then also respiratory paralysis from mechanical obstruction of the bronchi.

For the treatment in these cases the sulphate of soda is usually recommended as the best antidote, but its administration must be immediate, and it is also important that the acid should be at once neutralized by a base ; lime, which is almost always at hand, best fills this indication. But to meet the indications cited under the above divisions, no remedy presents much hope. Even should the individual escape immediate death, the condition of the respiratory passages causes grave anxiety, and the gloomy prospect of perforation of the stomach and stenosis of the œsophagus are equally of serious import.—*Gazette hebdomadaire de Médecine et de Chirurgie*, 1892, No. 14, p. 159.

THE GENERAL AND LOCAL TREATMENT OF TUBERCULOSIS BY INHALATION.

DR. I. NEUDÖRFER, after discussing fairly Prof. Koch's discoveries and arriving at a just estimate of their present failure when measured by the requirements of the practical physician, comes to an exemplification of his own method. The advantages are : (1) that its application is not limited by age, sex, or condition ; (2) that a marked improvement is clearly manifest after eight to fourteen days' treatment. Although he does not believe that there exists a specific for tuberculosis, yet there are many remedies that favor the cure of this malady, and indeed that it is a curable one, basing this opinion upon bacteriological and upon empirical-clinical evidence. The remedies upon which reliance must be placed should be not only harmless but

beneficial to healthy and diseased lungs; they should be capable of reaching the seat of the difficulty and should have an influence in preventing the growth and increase of tubercle bacilli, and indeed to destroy them, and also to give the organism opportunity to remove them. Believing that the ideal therapeutics of pulmonary tuberculosis consists in the administration of remedies by inhalation, he figures an apparatus which allows the remedy to be inhaled through the nose, but prevents the mingling of the expired with the inspired air. To this apparatus can be attached another for the atomization of liquids, or for inhalation of liquids dropped upon cotton, the latter being more particularly intended for anæsthetics and analgesics. When chloroform is used an automatic dropper is placed in connection with the cotton-retainer. As the result of experimentation with a large number of substances, he concludes that the number, depth, and rhythm of the respirations should be regulated by the physician—fifty or sixty respirations, at one or possibly two daily sittings, interrupted if necessary, which, however, should not be more than ten minutes in duration. He recommends several formulæ, chiefly combinations of creasote, guaiacol, phenocoll, piperazin, with ether, chloroform, or bitter almond water.—*Wiener Klinik*, 1892, Hefte 4, 5, S. 95-174.

[This is a valuable contribution, almost a monograph, to a subject that always excites interest. The argument is logical, the statements temperate, and it is well worthy of a careful perusal.—R. W. W.]

ANÆSTHESIA BY COCAINE.

DR. L. G. RICHELOT reviews the discussions of 1891 before the Société de Chirurgie, carefully weighing the opinions of Reclus, Berger, Schwartz, Regnier, Moty, and Trélat. Recognizing the advantages, the economy of time, absence of vomiting—but stating fairly the great disadvantage, the absence of sleep, which permits the patient to know all details—he believes that its harmlessness has not been absolutely demonstrated. He uses a 2 per cent. solution, twenty-five to thirty grains, believing it to be the best of the local anæsthetics, but its harmlessness as compared with chloroform must be determined.—*L'Union Médicale*, 1892, No. 46, p. 545.

TWO CASES OF TETANUS TREATED BY INJECTIONS OF ANTITOXIC BLOOD. (METHOD OF BEHRING AND KITASATO.)

M. L. RÉNON has observed in the service of Professor Dieulafoy two fatal cases of tetanus, but ten days intervening. The injections of defibrinated blood of rabbits, rendered immune against tetanus, were made by MM. Vailard and Roux. In spite of the fact that these cases resulted unfavorably, it is believed that this report may render assistance in determining the proper dosage. Tizzoni reported his case in August of last year, followed by another in November by Nicoladoni, a third by Gagliardi, the fourth by Pacini, all being successful; the only fatal case, previous to the present ones, is that of Baginsky and Kitasato in January, 1890. Tizzoni believes that rabbit serum is more efficacious than that of dogs. The fatal results in these cases are to be attributed to the greater gravity of the disease and the longer duration of it.

before treatment was instituted. Success requires early treatment and large doses, although the necessity of applying the remedy at an early date detracts much from the value of the treatment. The injections appear to be entirely harmless, and to have afforded a prompt, although temporary relief.—*Annales de l'Institut Pasteur*, 1892, No. 4, p. 231.

A CASE OF CHOREA TREATED BY CHLORAL HYDRATE.

MR. B. BASKETT reports a case of a girl of fourteen years who was suffering from rheumatism accompanied with chorea. The attack was her first, and was mainly right-sided. Improvement followed rest and the use of salicylate of soda, subsequently Fowler's solution. Becoming furiously excited, with incessant movement, she was chloralized, the necessary daily amount being about one hundred grains, until complete cure resulted.—*Lancet*, 1892, No. 3580, p. 796.

THE TREATMENT OF PLEURISY.

DR. P. DUROZIEZ ably argues that the treatment of this disease is something more than the treatment of the exudation; it is the treatment of the diseased pleuræ. Since pleurisies do not exist alone, often connected with bronchitis, or pulmonary accidents, not rarely with abdominal symptoms of typhoid character, consequently the treatment must vary according to circumstances. Of ninety-five cases treated, eleven died; in nine instances the necropsy showed evidence of tuberculosis in three cases only, and those were of the male sex. These figures do not establish the superiority of any treatment above another. Although he believes strongly in antiphlogistic treatment, yet bleeding is not indicated for this generation. In the cases cited, nine in number, the treatment was sufficiently varied.—*L'Union Médicale*, 1892, No. 62, p. 735, and No. 63, p. 751.

RECTAL ANTISEPTIC INJECTIONS IN EPIDEMIC INFLUENZA AND IN ADVANCED PHTHISIS WITH LARGE CAVITIES.

DR. T. C. VOIGT has treated over fifty cases in which he has made use of this method. He uses a drachm of pure oil of eucalyptus globulus mixed with about an ounce of warm olive oil, administered every two hours. When improvement sets in the dose is reduced to one-half drachm and the interval lengthened. He believes that the antiseptic action of eucalyptus oil is efficacious in cutting short the attack of influenza and in preventing altogether that nervous prostration and general breakdown which accompany and follow the disease, provided, always, that one is called to the case at a sufficiently early stage of the illness, and that there is no contra-indication in the state of the heart or kidneys.—*Lancet*, 1892, No. 3850, p. 795.

ON THE VALUE OF METHYLENE-BLUE IN MALARIAL FEVER.

DR. W. S. THAYER, after reading the results of the experiments of Guttman and Ehrlich, treated seven patients systematically, and arrived at about the same conclusions as Myer. 1. Methylene-blue has a definite action

against malarial fever, accomplishing its end by destroying the specific organism; but it is materially less efficacious than quinine, failing to accomplish its purpose in many cases when quinine acts satisfactorily.

2. The action appears to be rapid, the chills disappearing and the temperature, in the remittent cases, falling to normal during the first four or five days; but later, however, if a sufficient number of organisms have resisted the drug, they appear to develop again directly under its influence, causing a return of the symptoms.

3. Methylene-blue seems to have no advantages over quinine which would warrant its further use.—*Bulletin of the Johns Hopkins Hospital*, 1892, No. 22, p. 49.

The following papers are worthy of mention:

"Local Asphyxia of the Extremities," by PROFESSOR PETER, in *Revue de Thérapeutique Générale et Thermale*, 1892, No. 4, p. 49. Topical electrical salt-bath, the negative pole.

"Preventive Inoculation and Bacterio-therapie," PROFESSOR POTT, in *Therapeutische Monatshefte*, 1892, No. 1, S. 1; No. 2, S. 70. A careful and exhaustive review.

"On the Value of Parenchymatous Salt-water Injections in Acute Anæmias," by DR. KORTMANN, in *Deutsche med. Wochenschrift*, 1892, No. 16, S. 356. A careful study of the literature. Uses twenty to forty ounces of a six-tenths of 1 per cent. solution of table salt, reporting five cases. Believes it well adapted to take the place of transfusion, to be simple, and without danger.

MEDICINE.

UNDER THE CHARGE OF

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A VARIETY OF SUGAR HITHERTO NOT OBSERVED IN URINE.

SALKOWSKI and JASTROWITZ (*Centralbl. f. die medicin. Wissensch.*, 1892, No. 19, p. 337) found, on heating with sodic hydrate and copper sulphate the urine of a man, twenty-nine years old, under treatment for morphinism, that a precipitate of yellow copper oxyhydrate was thrown down, while the fermentation-test and polarization-tests at times yielded negative results and at other times indicated the presence of sugar. The urine, that failed to

present the usual reactions of sugar, when heated for a considerable time with phenylhydrazin hydrochlorate and sodium acetate yielded a well-characterized osazone. If 100 c.cm. of the urine were heated with 2 gm. of phenylhydrazin hydrochlorate and 4 gm. of sodium acetate, on cooling in the course of twenty-four hours a thin, pasty mass resulted. The quantity of osazone present was small—about .3 gm. to 100 c.cm. of urine. This osazone is distinguishable from phenylglucozone by its boiling-point, as well as by its comparative solubility in hot water. It crystallizes from water as lemon-yellow, interwoven needles of silky lustre, melting at about 157° or 158° C.

EXALGINE IN GRAVES'S DISEASE.

DR. T. CHURTON, of Leeds, records the following case (*Lancet*, 1892, No. 3587): A woman aged twenty-eight years, of fair complexion, having typical Graves's disease, had, after some months, extreme exophthalmos and congestion of both conjunctivæ, with ulceration of the left cornea. Leeches, lotions, etc., gave very little relief. At length, the pain becoming severe, exalgine was tried, half a grain dissolved in five minims of spirit of wine, and a tablespoonful of water, every half-hour for three times when pain was present. Next day not only was the patient free from pain, but the congestion had entirely disappeared; the eyes had changed from flaming red to perfectly white. During the next month, to satisfy himself and several critical observers as to the influence of exalgine, experiments were made; all the other drugs and appliances were tested in turn. The result was always the same: when exalgine was given the eyes were white; when it was omitted they became red and painful within a day, no matter what other drugs were given or lotions applied. As upon trial being made it seemed that the good effect was less marked when the whole dose of a grain and a half was given at one moment than when it was given in divided doses—half a grain every quarter of an hour for three times—it was ordered to be taken regularly in this manner every four hours.

HEMORRHAGIC NEPHRITIS, OR BLOOD TUMOR OF THE KIDNEY.

DR. THOMAS OLIVER (Newcastle) records under this title a case of some interest (*Brit. Med. Journal*, 1892, No. 1630). A young woman, aged twenty-three years, was admitted to hospital complaining of pain in the chest and a swelling in upper part of right chest, of one month's duration. Her mother had died at thirty-eight of cerebral hemorrhage—beyond this the family history was unimportant. The onset was quite sudden and attended with severe pain. The lump below right clavicle was noticed a few days before admission. She was well nourished. On admission she complained of distressing palpitation, and had an anxious expression. Between the first and second cartilages near the sternum was a tumor as large as half a billiard-ball, pulsating synchronously with the heart, slightly expansile, and dull on percussion. Pulse hard; cervical veins distended; temperature 101°; breathing quickened.

A few days after admission the urine, with a specific gravity of 1012, was

found to contain one-eighth albumin and many granular casts. Right pupil larger than left, discs normal.

Within three weeks the tumor ceased to pulsate, and fluctuation was detected in it. Epistaxis now supervened and recurred several times. Shortly after there was a sharp attack of pericarditis, which yielded rapidly to treatment. The sternal tumor continued to diminish in size, and yielded blood and pus when explored with a fine syringe. Improvement was maintained for about a fortnight, when she experienced severe pain in the right side of the abdomen. A large swelling was found to have suddenly formed over the seat of the right kidney. Constant vomiting was now a prominent symptom. Hæmaturia appeared and lasted for one week. Fluctuation became apparent in the abdominal tumor, from which some dark blood was removed by an aspirating-needle. The temperature now oscillated irregularly, at times reaching 103°, and pericardial friction with pain and dyspnoea recurred at intervals. Œdema of the feet gradually developed; the grasp of the right hand became weak, and with tingling sensations in the hand; being followed by complete paralysis of the flexors of the right fingers, with anaesthesia over the area supplied by the median nerve. From this date onward there is a record of recurrent pericardial attacks and epistaxis, gradual diminution of urine and extension of œdema, ending in fatal coma.

Necropsy.—On reflecting skin of chest no trace of cyst-cavity could be made out. The right lung was adherent to the chest-wall near the sternum, and to the pericardium. Pleura contained fluid—dark and blood-stained. Nothing was noticed in the pleural cavity which could explain the pulsating tumor on the chest-wall. Both lungs were œdematous. Pericardium was generally adherent to the heart. The wall of the left ventricle was thick; cavity slightly dilated; valves healthy. Bronchial glands cheesy. The abdomen contained a large quantity of coffee-colored fluid.

Occupying the right lumbar region was a tumor the size of a cocoanut, firmly adherent to the intestines. On removal it was found to be the kidney, which had undergone alteration, nearly the whole of the tumor being composed of blood lying loosely or in small loculi. Very little kidney structure remained save a delicate gray streak at the periphery. The left kidney was extremely contracted, although the capsule was easily removed, leaving a granular surface behind it. The liver was nutmeg, with small masses of yellowish-white substance around the biliary canals (cirrhosis)

On microscopical examination of what is left of kidney structure in the renal hæmatoma, there is observed very marked tubular nephritis. The secreting cells are very much enlarged and granular, and at places are breaking down, the débris occupying the interior of the tubule. The Malpighian glomeruli are enlarged; their capsule is thickened. At places the interstitial tissue is increased. Here and there in the section the fibrous tissue is so much increased and laminated that it looks as if it was composed of shrunken compressed tubules. It is this thickened tissue that forms the lining of the cyst which contains the blood; the other part of the section simply shows blood-clot, blood-cells, and blood-crystals. The left kidney is the seat of interstitial nephritis.

“The pathology of this case is somewhat obscure. Can it have been one of masked hæmophilia? The development of a blood tumor in the chest-

wall, the recurrent epistaxis and hæmaturia, and the presence of blood in the pleural cavity and in the right kidney—all these suggest this as a possible explanation. Against these must be placed, however, the absence of bleeding in the family history, although it is to be remembered that patient's mother died of apoplexy (cerebral hemorrhage?) at the age of thirty-eight, and the existence of left-sided interstitial nephritis and biliary hepatitis in the patient herself. Disease of the kidney, by attenuating the blood, may have allowed it to ooze more easily out of the bloodvessels, and thus a tendency to bleeding became established, which was not without its influence in hastening the fatal termination."

CIRCUMSCRIBED TUBERCULOUS PACHYMEINGITIS.

GUSSENBAUER (*Wiener medicin. Presse*, 1892, No. 16, p. 643) has reported the case of a man, twenty-one years old, with a tuberculous family history, who, four weeks after a blow in the right parietal region, without loss of consciousness, without abrasion, without extravasation of blood, without notable pain, was seized with severe pain in the region of the injury, followed by fever and chills. Shortly afterward diplopia developed, pain was also felt at the nape of the neck, and a lymphatic gland in the left nuchal region became enlarged to the size of a pea. Eight weeks after the accident, a soft painful tumor formed at the site of injury, while repeated chills occurred. The swelling attained the size of a hen's egg, the pain, the diplopia, and the sleeplessness gradually disappearing. The tumor was incised, and pus and necrotic tissue escaped. The febrile attacks ceased, although the suppuration continued, a fistula persisting. A considerable defect of bone resulted, and the pulsation of the brain could be felt. From the course of the affection, the persistence of a thin, purulent discharge, the tuberculous heredity, and the signs of an area of condensation in one lung, a diagnosis of primary circumscribed tuberculous pachymeningitis was made, which was confirmed by an operation. A fungous mass, as large as a hen's egg, was found seated upon the dura mater. The growth was removed by means of a sharp spoon. The wound was irrigated with 1 : 1000 sublimate solution, its surface dusted with iodoform, and its margins approximated by suture. The patient recovered from the operation, and subsequently did well.

THE INFLUENZA.

CURTIN and WATSON (*Climatologist*, ii. 5, p. 77) present the results of observations made in some five or six thousand cases of influenza seen in the epidemics of 1889-90 and 1890-91. Their experience supports the view of the contagiousness of the disease. In a family or in a community, all escaped or many became victims. The contagiousness appeared to be feeble. Slight obstacles prevented direct transmission. Crowding seemed to intensify the degree of contagion. Catarrhal conditions of the respiratory tract were common. The bronchitis presented peculiarities: it was protracted in duration, sometimes lasting for months; it shifted its seat, successively invading all parts of the lungs; it was attended with the secretion of tough, viscid mucus, difficult of expectoration; in the second epidemic the sputum resem-

bled clear boiled or scalded starch or tapioca; sometimes it was frothy, sometimes black, as if from soot or coal-dust. The cough was irritative or explosive, sometimes resembling that of whooping-cough. Low-pitched râles were heard. The patient appeared to breathe, though the chest failed to expand, and the respiratory murmur was not detectable. The condition was thought to be dependent upon paralytic dilatation of the bronchioles and air-vesicles. Both croupous and catarrhal pneumonia were rarely seen. Insomnia was common. Delirium was rare during the febrile period, and was not aggravated. Insanity, transient or permanent, was encountered with relative frequency. Meningitis was not uncommon. Convulsions were rare, but loss of consciousness was occasionally encountered at the onset of attacks. Hemiplegia and paralysis of the arms and of the legs were observed in isolated cases; recovery was the rule. Headache was common. Vision was often impaired; in some cases hearing was deranged; paræsthesiæ were observed in numerous cases. Neuritis was rather common. Neuralgia was rare. The powers of generation were enfeebled. The senses of smell and taste were perverted, rarely lost. Spasmodic affections, such as hay-fever and asthma, apparently underwent improvement. Prostration and exhaustion were marked. The digestive system presented evidences of lack of tone. The circulatory apparatus manifested symptoms indicative of want of nervous influence. In many cases death was due to heart-failure. Hemorrhages from various mucous surfaces were common. In some cases chronic parenchymatous nephritis developed. Abortion was rarely induced. Pregnant women seemed to escape or to have mild attacks. Various cutaneous eruptions were observed in a considerable number of cases. The temperature ranged fairly high—between 101° and 105°. In mild attacks the temperature became temporarily subnormal. In a few cases the temperature was subnormal throughout. Relapses were most common in active middle life, in those exposed to cold, dampness, anxiety, and fatigue. In one case seven relapses were observed. The various and varied manifestations seemed best explicable by a condition of vasomotor paralysis dependent upon the presence of a microbe in the blood.

SURGERY.

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THE MANAGEMENT OF COMPOUND DISLOCATIONS OF THE ANKLE-JOINT.

SCODDER (*Boston Med. and Surg. Journ.*, vol. cxxvi., No. 14) gives the following outlines for the treatment of these injuries: "1. If the laceration is

so great that the foot is useless, amputation is necessary. Amputation is indicated in but two other instances—old age and sepsis. 2. If the laceration is not great, and the dislocation can be reduced, it should be reduced without excision; proper drainage being provided both anterior and posterior to the joint. 3. If the laceration is not great and reduction impossible, then an excision should be done, either partial or complete. 4. If there is great injury to bone, whether the dislocation can or cannot be reduced, a partial or complete excision should be done." He reports a recovery after reduction and antiseptic treatment of a dislocation with extensive laceration which involved the dorsalis pedis artery and the anterior tibial tendon; there was ankylosis, but no shortening.

POST (*Ibid.*) reports two cases of dislocation with laceration in which, after antiseptic cleansing, an antiseptic gauze and plaster dressing was applied to fix the joint. In the first case the temperature rose to 101° on the two successive evenings, but afterward fell to normal. The first dressing was done on the thirteenth day, when the wound was healed, except a small granulating surface; the plaster dressing was replaced, and on the thirty-third day the wound was found to be perfectly healed. The patient had but a slight limp and no shortening. In the second case there was considerable comminution of bone; the fragments were removed, the wounds in the periosteum and skin sewn, and a dressing similar to the first applied. The first dressing was on the fourteenth day, when slight external sloughing was found, but the patient made a good recovery with a normally movable joint. "The principal point in the treatment of these cases was the disinfection of the wound, but the immobility, as secured by the plaster bandage, was almost of equal importance."

THREE RECENT CASES OF ŒSOPHAGOTOMY.

GAY (*Boston Med. and Surg. Journ.*, vol. cxxvi., No. 14) adds the following interesting cases to the literature of this subject:

Case I.—Child, aged three and a half years. A coin three-quarters of an inch in diameter was removed from the lower end of the œsophagus through a lateral incision in the neck; recovery in thirteen days. In perfect condition when seen twenty-five days after operation.

Case II.—Male, aged twenty-eight years. Four false teeth with plate were removed from the œsophagus four inches below the top of sternum, through a lateral incision; the wound was closed with silk sutures, but was opened on the third day and found to be septic, but not suppurating. Patient died on fifth day in typhoid state. Death was due to septicæmia and exhaustion. He thinks the open method with free drainage preferable, though he had succeeded in a former case with the method used.

Case III.—Male, aged forty-eight years. Œsophageal stricture eight inches from incisors; impossible to pass bougies; œsophagotomy; intubation through the stricture, the entrance being found one inch above the bottom of the sac on its anterior wall. Patient improved, left hospital a month after operation, but returned to die from exhaustion and emaciation three weeks later, his life having been relieved of suffering and lengthened two months by the operation, which was justifiable as a palliative measure.

A CASE OF TORTICOLLIS DUE TO HÆMATOMA OF THE STERNO-MASTOID MUSCLE.

LOVETT (*Boston Med. and Surg. Journ.*, vol. cxxvi., No. 13) reports the following case. The patient, six weeks old, showed a tumor the size of a hazel-nut, confined to the left sterno-mastoid muscle, which was then slightly contracted, turning the head to the right. The position could be corrected, though not beyond the normal. On general treatment the tumor gradually disappeared. When seen eighteen months later, marked torticollis was present, distinguishable from the routine case only by its history. The contraction of the sterno-mastoid had increased, the position could not be corrected, and there was some asymmetry of the eyes.

REFLEXES IN HIP DISEASE.

BRACKETT (*Boston Med. and Surg. Journ.*, vol. cxxvi., No. 13) draws the following conclusions from the comparative study of forty-seven cases of hip disease and twenty-one of spinal caries. The condition of the reflexes of the patella tendon depend on the same general causes as the muscular spasm. When muscular spasm is absent the reflexes are not altered. If, however, the joint is irritable we may expect to find the reflexes increased on the diseased side. "The presence of subjective symptoms does not apparently affect the phenomenon. The value of this is twofold: it becomes an indication of the irritability of the joint, in the absence of subjective symptoms, in the same way as does the involuntary muscular spasm, and also of diagnostic value in the early stages in the absence of other indications. In this it can be used as one of the evidences in distinguishing between early hip and low lumbar caries, for a marked difference is shown in the case of spinal caries in this matter of reflexes, as these show an almost constant uniformity, and are not only equal, but much less likely to be exaggerated even with the presence of other disease." In old cases with marked atrophy the value of this sign is doubtful. It is simply one valuable sign in determining the condition of the joint, but not an infallible one.

TUBERCULOUS HERNIÆ.

SPRENGLE (*Centralbl. für Chir.*, 1892, No. 8), reviewing an article by Jonnesco on "Tuberculous Herniæ" (*Rev. de Chir.*, 1891, Nos. 3 and 6) criticises the author's division of only eleven cases collected into (1) tuberculosis of the hernial sac, (2) of its contents, and (3) of the contents and sac, declaring that they are only the stages which can be found in all tubercular disease of that region. He also differs from the author in the view that this is an especially favorable position, on account of the blood stasis present, for the development of tuberculosis. Jonnesco contradicts himself in his article by stating that this is a very rare position for tubercular disease, and furthermore, accounting for this rarity by claiming that hernia is found more frequently in men of arthritic than in those of tubercular diathesis, dividing them according to this seemingly popular French hypothesis. In speaking of the author's clinical division of herniæ into latent, painful, and inflam-

matory, the latter complicated by strangulation or becoming irreducible, Sprengle says it is scarcely necessary to remark that there are symptoms distinctly different that divide these latter and make two separate clinical divisions. He then quotes Jonnesco as saying that the diagnosis must be made from the ordinary and the carcinomatous forms of hernia, and that the indications for operation are those common to ordinary herniæ and call for herniotomy or other operation for radical cure; and in addition for the removal of the tuberculous disease. If this latter is indicated and extirpation is possible, it should be done even if it require resection of the intestine. The view is advanced that simple herniotomy may produce the same beneficial results as have followed exploratory laparotomies in tubercular peritonitis, and if the disease has extended into the peritoneal cavity, a laparotomy is indicated.

SEVERE HEAD INJURIES—RECOVERY.

REID (*Australian Med. Journ.*, vol. xiv., No. 2) reports the following case of uninterrupted recovery after undoubted fracture of the base of the skull. E. S., aged twenty-five years, a strong healthy woman, was thrown from a cart, striking directly upon her head. When seen there were present symptoms of shock and concussion, and in addition blood-stains on both nostrils, but no discharge. A linear depression could be seen and felt, extending from the upper and outer part of left parietal eminence to centre of left upper orbital margin, indicating a fissured fracture of that region. There was ecchymosis of left upper eyelid, with protrusion of the eyeball and subconjunctival ecchymosis, showing involvement of the orbital plate. There was a watery discharge, blood-stained and frothy, from the left ear, and although the patient breathed with mouth open, air was found to be puffed out freely with each expiration; this symptom the author would account for by a fracture of the petrous bone, extending from its cerebral to its inferior aspect and communicating with the pharynx by a wound of the mucous membrane, and he believes the continuous vomiting of dark grumous blood to have been due to the communication established by this wound between the pharynx and the petrosal fissure. The patient continued comatose with bloody emesis at lengthening intervals for twenty-four hours, regaining entire consciousness after forty-eight hours. A copious clear discharge containing sodium chloride continued for nine days from the left ear. The temperature was about normal, with the exception of one rise to 103°. There was no paralysis observed, and she was out of bed in five weeks, the only permanent damage being total deafness on left side, even to bone-conduction, which he believes to be due to injury to the auditory nerve and rupture of the tympanum. The treatment was rest, ice to the head, laxatives, and iodoform blown into the ear.

TREATMENT OF VARICOSE VEINS OF THE LEG, COMPLICATED BY ULCERS.

MAYLARD (*Glasgow Med. Journ.*, vol. xxxvii., No. 3) gives the following as a successful method of treating sluggish ulcers of the leg. He says:

"By antiseptic solutions the surface of the ulcer is cleansed, and it and the surrounding parts are rendered healthy and active by the daily applica-

tion of massage. So soon as I have reason to believe that the ulcer is a healthy, healing wound, the matter of operation is considered. The skin over and around the portion of vein that is to be removed is prepared in the usual way. An incision is carried through the skin along the whole length of the portion of vein to be excised. When exposed, it is dissected up, ligatures applied around each radicle of the varicose trunk, and the trunk itself tied above and below. The skin wound is then stitched up carefully and dressed antiseptically."

He considers the operation to be justifiable and harmless, if the patient is properly prepared and thorough antiseptics is carried out. In the three cases which he uses as illustrations, the wounds healed by primary union, with no rise of temperature after operation; the ulcers healed and remained firm, with no sign of recurrence months after operation.

THE TOXIC ACTION OF IMPURE CHLOROFORM.

DUBOIS-REYMOND (*Brit. Med. Journ.*, No. 1622) says that the difference found between the physiological action of pure chloroform produced by Pictet's process of refining, as opposed to that of the impure residue from that process, is as follows:

1. No difference was found in the pulse-waves nor in the frequency of respiration; the former being equally affected by both forms of the drug, the latter varying considerably.
2. The pulse-rate, compared in nineteen cases, is higher at the close of the experiments with residue than of those with pure chloroform.
3. The blood-pressure in by far the greater number of the experiments at the moment the respiration stops is higher after inhalation of pure chloroform than after inhalation of the impure residue.
4. The residue causes stoppage of respiration much more quickly than pure chloroform.

These experiments, conducted with chloroform refined by Pictet's process, from what is considered pure chloroform commercially, show how necessary is the testing of chloroform before its use, as even the best, commercially, is impure.

THE FUNCTION OF THE THYROID GLAND.

After an elaborate historical study of the theories which have been pronounced concerning the thyroid gland, and a discussion of the nature of its tissues, HORSLEY (*Brit. Med. Journ.*, No. 1622) concludes "that the thyroid gland is a structure essentially connected with the metabolism of the blood and tissues; that in fulfilment of its functions it is hæmopoietic both directly and indirectly, and that it secretes from the blood a colloid substance, which is transmitted *viâ* the lymphatics from the acini of the gland to the circulation;" and further, "that the thyroid gland is in functional activity before birth, and is of special metabolic importance in early extra-uterine life, while its value diminishes as the general vital processes increase." Indirect evidence affords very weighty testimony in favor of the view that the thyroid is, in truth, the important organ of metabolic influence that the general results of thyroidectomy would lead us to believe it to be.

SYSTEMIC ANTISEPSIS AND THE MERCURIAL SALTS.

LEREBOULET (*Gaz. hebdomadaire de Méd. et de Chir.*, 1892, No. 9) reviews an article in which Robin concludes: 1st, that systemic impregnation by mercurials is impossible; 2d, that its internal administration does not prevent or decrease, but rather facilitates the action of the microbes of infectious pneumonia; 3d, that in no case can we judge from cultures in glass of the action of drugs upon microbes in the body, but only through cultures and experimentation upon animals. Lereboullet says these conclusions compel us to acknowledge the absolute inefficacy of sublimate as anything but a local antiseptic, and asks if we must apply this reasoning to all antiseptics which we hope to use systemically, understanding by systemic antiseptics the impregnation of the entire system by a substance toxic to microbes, and introduced either by the mouth or by hypodermic injections. Must we conclude that internal antiseptics is impossible, and condemn the attenuated animal virus, not to mention the *toxines* or products of microbic secretion, which, without destroying, hinder perhaps the action of bacteria? Do we not know remedies which eliminated by the lungs act upon the tubercular lesions? Does not creasote act sometimes in this manner, and do not the antiseptics, though insoluble, render daily service in the stomach and intestines? He says we must not be discouraged, and must try to find methods that will destroy the noxiousness of antiseptic *toxines* or that will so act upon the living cell as to make it resistant to the pathogenic microbe. In this connection he mentions briefly the paper of d'Arsonval upon the preparation of liquids derived from the different tissues of the body to be used as medicaments. This he says is an attempt to institute a new therapy whose value can only be determined by long and careful experimentation. These experiments are being carried on by skilled observers under the instruction and with the liquids prepared by Brown-Séquard and d'Arsonval, and if they prove what has already been declared by Paul, the value of the discovery cannot be denied.

ANEURISM OF THE ASCENDING AORTA.

WEIR and PAGE (*N. Y. Med. Journ.*, vol. iv., No. 19) report a case of aneurism which was treated without success by the needling method of Macewen, of Glasgow. Reviewing his work, they say: "Macewen not only scratched or irritated in each case, with the needle-point, the interior of the aneurism, but left the needle impinging on the opposing wall for periods varying from twenty-four to forty-eight hours; this not with the intent of obtaining coagulation on the needle, as in the older methods of treatment, but that the wall of the aneurism might be more thoroughly roughened."

This method Weir applied in three sittings. He used needles varying in size from one-half to one and one-fifth millimetres in diameter, their length being six inches, and found the larger to be the more efficient, but he allowed them to remain *in situ* only for about forty to fifty minutes, as the walls of the aneurism were considered to be too thin for safely leaving them longer. The largest area scratched did not exceed, at any of the sittings, the palm of the hand. No serious symptoms were shown by the patient; there was

slight spouting of blood after the withdrawal of the larger needles, but it was easily controlled by the finger. There was also some coughing with expectoration of blood, probably due to the wounding of the lung posteriorly. The patient died two months after the last operation, treatment being discontinued at the desire of his relatives. The post-mortem showed but slight deposits of leucocytes and fibrin, and the results of the treatment were so far negative. The aneurism was six inches and one-half by eight inches, springing from the ascending aorta, and its walls were extremely thin.

[Reference to Macewen's original paper will show that he does not attempt to "roughen" the internal wall of the aneurism and thus to produce either coagulation or deposition of fibrin. White thrombi are prone to form in the interior of a vessel at a spot where irritation has been induced and from which the endothelium has been removed. In an aneurismal sac this may be done by irritating the wall of the aneurism in such a way as to induce infiltration of the parietes with leucocytes, and a segregation of them from the blood-stream at the point of irritation; the irritation ought to be sufficient to set up a reparative action. In Macewen's cases the pins were left in for hours, in one case for forty-eight hours, which period he thinks should never be exceeded.

In the above case the shortness of the time during which the pins could be left in the aneurism, the size of the latter, and the thinness of its walls sufficiently explain the lack of success. Although Macewen has expressed the hope that the method would not be indiscriminately employed in every case of large aneurism, careful records by such good observers as Drs. Weir and Page, even in unsuccessful cases, will add to our knowledge of this important subject.—J. W. W.]

A CASE OF LOOSE BODY IN THE KNEE-JOINT DUE TO DETACHMENT OF ARTICULAR CARTILAGE.

In the *British Medical Journal* for May, 1892, BURGHARD records the history of a young man aged twenty-four, who, in vaulting a gate, received a violent blow on the knee by the top rail. Motion of the joint caused a sharp pain, "like pins and needles running into the knee." The limb became swollen and discolored, and the patient was confined to bed. When seen by the author, three days later, there was much synovial effusion. On palpation an acutely tender spot was found over the inner condyle. When the swelling had subsided sufficiently, slight crepitus was detected over the tender spot, which at a later day was found to be due to a movable body at the inner edge of the articular cartilage of the femur about opposite the middle of the patella. Detachment of a piece of articular cartilage was diagnosticated, and arthrotomy performed. Immediately upon opening the capsule of the joint, the loose fragment presented. It measured $\frac{3}{4}$ by $\frac{1}{2}$ inch.

Exclusive of synovial apoplexy, masses of effused fibrin, and tuberculous disease, loose bodies in the knee-joint may be divided pathologically into three groups: 1. Osteo-arthritis. Of sixty-nine cases of which the author has notes, symptoms of this disease were present or developed in fifteen. 2. Direct detachment of articular cartilage by violence. The case reported belongs to this group. 3. Changes in the synovial membrane not due to

osteo-arthritis. The latter group embraces the cases that arise spontaneously or follow some considerable time after injury. The author believes that injury is an important etiological factor. Of the sixty-nine cases, there was a definite history of injury in thirty-six.

DERMATOLOGY.

UNDER THE CHARGE OF

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PECULIAR CASE OF PIGMENTED SARCOMA OF THE SKIN.

P. S. ABRAHAM (*Brit. Med. Journ.*, Jan. 2, 1892) records, with a portrait, a rare form of sarcomatous disease, occurring in a woman aged fifty years, which closely resembled leprosy in its manifestation on the skin, for which it was mistaken by three medical men. The whole of the face and ears were the seat of nodulated growths, with broad bases continuous with one another, giving an undulating surface to the face, of a bronze color and shiny appearance. There was but little pain. On the trunk and extremities were spots slightly raised; those on the breasts and forearms were pigmented; those on the abdomen and legs were reddish. Two months later the face was enormously swollen into a purplish-brown, pudding-like mass, here and there ulcerated. The patient died, apparently from an attack of bronchitis, induced undoubtedly by exhaustion. For several weeks before death the swelling disappeared, her general condition improved, and it was even thought that she was going to recover. The growth was composed of small round cells, densely packed in places, much resembling those of lymphoid tissue, together with pigmented cells and scattered granules and masses of pigment. The author thinks that while it might be regarded by some as "granuloma," it favors more sarcoma, and that the case differs both from "mycosis fungoides" and from Kaposi's "idiopathic multiple sarcoma," which was the view also entertained by several distinguished dermatologists.

SYPHILIDIFORM ERYTHEMA.

A. FOURNIER (*Rev. gén. de Clin. et de Thérap.*, 1892, No. 8) describes an erythematous disease of the skin occurring in infants between the ages of three and eight months, which is often confounded with syphilis. In most cases it appears in those who suffer with diarrhœa, and occupies the genital region and the thighs. It begins as a papulo-vesicle, resembling closely a vaccine papule. In the second stage the centre becomes depressed, the vesicle ruptures, the surface is eroded, and may resemble a moist papule. A second crop of lesions usually appears at the end of a few days, undergoing the same

changes as the first. The disease is, in most cases, a local one, though the glands may become involved. The treatment should consist of cleanliness, a boric acid lotion, and dressing with zinc oxide, bismuth, or iodoform salve. The diagnosis is of the greatest importance.

THE VALUE OF HEAT IN THE TREATMENT OF SYPHILIS.

AUSSASS (*Journ. des Mal. Cut. et Syph.*, Jan., 1892) gives the case of a young man, aged seventeen, who had contracted the disease from a wet-nurse, and who for two years had suffered with persistent headache, which yielded neither to mercury nor to full doses of iodide of potassium. Daily hot baths in combination with mercurial inunctions were ordered, under which marked improvement followed in a short time.

COD-LIVER OIL AND IODOFORM LOCALLY IN LUPUS VULGARIS.

ZILGIEN (*Rev. gén. de Clin. et de Thérap.*, 1892, No. 3) reports the case of a woman, thirty-three years of age, who had a patch of lupus on her left cheek, which was cured by the curette. The right cheek then became in like manner diseased, upon which iodoform was used, but unsuccessfully, whereupon iodoform gauze, dipped in cod-liver oil, was applied as a dressing, which was daily alternated with simple iodoform powder, cicatrization taking place rapidly wherever the oil was applied.

CASE OF DERMATITIS TUBEROSA FROM IODIDE OF POTASSIUM.

DR. HOLSTEN (*New York Med. Journ.*, April 23, 1892) reports the case of a child, aged sixteen months, who for bronchitis took two drops of a saturated solution of iodide of potassium every two hours; on the third day, light reddish-brown papules appeared on the face and extremities. The general health improved, and the bronchitis disappeared. In all, less than a drachm and a half of the drug had been taken. The papules became larger, raised, flattened, the color varying from pink to yellowish-brown, studded with minute whitish specks, from which, on puncturing, a thin, white fluid exuded. A week later the lesions on the leg had assumed a fungoid or cauliflower appearance, bathed in pus, and bleeding easily. The lesions seemed to heal more rapidly under an ichthyol lotion (10 to 30 per cent.) than under several other modes of treatment used. The author in his article reviews the subject of eruptions from the iodides, and gives a bibliography.

CASE OF LYMPHANGIOMA.

M. J. EPSTEIN (*Journ. of Cutaneous and Genito-urinary Diseases*, June, 1892) reports (with two good photographs) a case of this rare disease. The subject was a woman, aged forty, a native of the United States. The disease was situated over the entire pubic region and lower portion of the abdomen and on the left buttock, consisting of a mass of small, pea- and bean-sized, pinkish, vascular papules and nodules, thickly studded, so as to form an elevated, tuberculated patch, the lesions resembling in form those of molluscum fibrosum or warts. Upon pricking the lesions, which had thick walls—con-

siderable clear, transparent, gelatinous fluid exuded for three or four hours. They filled up, itched, discharged, and dried up from time to time. The disease had existed sixteen years, and seems to be a typical example of lymphangioma.

LUPUS VULGARIS: SOME CONTROVERSIAL POINTS.

J. F. PAYNE, the well-known London pathologist and dermatologist (*Brit. Journ. of Derm.*, vol. iii., No. 38), gives a *résumé* of some points which are the subject of controversy. The cause of lupus is some specific irritant or virus. The structure of the tissues shows that it belongs to the granulation new-formations, in which group of diseases there is a sort of living "thorn in the flesh"—an irritant continually acting at one or more points. In the tissues of lupus has been found, very sparingly, and often sought for in vain, a bacillus identical, in form, size, and relations to staining reagents, with the bacillus of tubercle. The disease may be regarded as a very slow and chronic form of the tuberculous process, remaining for the most part local, differing from other forms of tuberculous disease chiefly in its slowness, its feeble infectivity, and the paucity of tubercle it contains. The skin is not a favorable soil for this bacillus, which takes root here with difficulty, due probably to the lower temperature of the skin than that of the internal organs. As to the mode of infection, in some cases it occurs by direct implantation in the skin by wound or otherwise; and attention is called to another possible hypothesis—that of direct inheritance, or an inherited predisposition to be attacked by the bacillus.

FAVUS AND ITS TREATMENT.

DR. SHELDON G. EVANS, U. S. N. (*Medical Record*, April 30, 1892), gives the results of treatment of one hundred and thirty-nine cases of this disease, occurring aboard ship, with few exceptions all the cases being among the apprentice boys. The origin of the disease was traced to an apprentice boy from Germany. The cases are not detailed, but the disease seems to have manifested no peculiarities. The treatment (which was suggested by the senior medical officer of the ship, Dr. Price) was eminently satisfactory. The hair was cropped short and kept so during the treatment. The effective remedy was an alcoholic solution of bichloride of mercury (1 : 500), applied with stiff brushes, the scalp being scrubbed with the solution every other day for a week or ten days, and then bathed twice a week with a solution of the same strength prepared with water and glycerin. When the scalp became inflamed mild sulphur or mercurial ointment was used. The cases all improved rapidly, many were entirely cured, and none developed a second attack.

PILOCARPINE IN DISEASES OF THE SKIN.

ROBERT M. SIMON (*Birmingham Medical Review*, February, 1892) discusses this subject briefly, and gives favorable results from the use of the drug in a case of chronic eczema with great thickening and pigmentation of the skin, occurring in a man who had suffered much for fifteen months. In all, he had received 110 hypodermatic injections, of $\frac{1}{2}$ or $\frac{1}{4}$ grain each, twice daily, the

treatment being from time to time interrupted, and was cured. He suffered no local or general discomfort from the remedy. In pruritus senilis good, though only temporary, results were obtained from the drug. In psoriasis no benefit was derived, while in subacute eczema the results were bad.

BASSORIN PASTE IN THE TREATMENT OF SKIN DISEASES.

GEO. T. ELLIOTT (*Journ. of Cut. and Gen.-urin. Dis.*, May, 1892) again calls attention to the value of this new vehicle for the application of remedies in cutaneous diseases. The formula is as follows: R. Bassorin, 48; dextrin, 25; glycerin, 10; water, q. s. ut ft. 100. The resulting paste is a smooth, jelly-like mass, resembling petrolatum in color. It is odorless and unobjectionable. It must be kept in a closed glass jar. Various substances may be incorporated with it, which, owing to the adhesive properties of the paste, are brought in close contact with the skin. It is of more service in winter than in hot weather. It proves useful in papular acne, rosacea, seborrhœic eczema, and in the parasitic skin diseases. The absence of greasiness and stickiness, and its cleanliness, commend it in many cases, and especially in those cases where fatty substances are not well borne.

DERMATITIS HÆMOSTATICA.

DR. H. G. KLOTZ (*Transactions American Dermatological Association*, New York, 1891) suggests the name dermatitis hæmostatica for the more or less chronic conditions of the leg commonly called "sore leg," occurring for the most part in elderly persons belonging to the laboring classes, the pathological state being characterized by dilatation of bloodvessels, swelling, discoloration, hemorrhage, hard infiltration, hyperplasia, atrophy, ulceration, and cicatrization. External injury does not play a part in all of such cases. The subjective symptoms are slight, though a sense of heaviness or soreness may be present. Eczema may complicate the condition.

UNIVERSAL ERYTHEMA MULTIFORME.

DR. L. A. DUHRING (*Ibid.*) describes a case of universal erythema multiforme, the eruption being of an erythematous type with a tendency to papular and vesicular lesions in certain localities, the whole process in two or three weeks terminating in extensive exfoliation of the whole epidermis. There was itching, and the case presented features showing the process to be allied to dermatitis exfoliativa.

NEW METHOD OF SKIN-GRAFTING.

DR. MORROW (*Ibid.*) describes a new method of skin-grafting, the peculiarity consisting in the depth of the graft, which includes the entire thickness of the skin and in some cases a layer of subcutaneous tissue, and in the method of procedure, which consists in removing a button of tissue of any required depth by means of a round cutting instrument known as the Keyes cutaneous punch, and immediately inserting it in a receptacle or bed previously made by the same instrument. The method constitutes an ideal

treatment for small circumscribed malignant and papillary growths occurring on the face, such as epitheliomata, lupus nodules, moles, warts, and other facial blemishes.

HYDRARGYRUM FORMAMIDATUM IN SYPHILIS.

DR. MORRISON (*Ibid.*) recommends the hypodermatic use of hydrargyrum formamidatum in syphilis, stating that in obstinate cases it can be relied upon to accomplish what no other form of treatment has done. There is no danger of abscess resulting. A one per cent. solution is used.

SARCOMA OF SKIN.

DR. F. J. SHEPHERD (*Ibid.*) reports an unusual case of sarcoma involving the skin of the arm, which was amputated at the shoulder-joint. There was a recurrence of the growth in the stump, which was excised, and subsequently, to relieve pain, the brachial plexus cords were resected, with relief of pain. The lymphatics were early and extensively involved—an unusual course in spindle-celled sarcoma.

MULTIPLE SARCOMATA.

DR. SHERWELL (*Ibid.*) gives a paper entitled "Multiple Sarcomata," with the history of a case showing modification and amelioration of symptoms with large doses of arsenic, which remedy possessed over the disease a positively beneficial effect, causing the tumors to entirely disappear; but subsequently, upon cessation of the remedy, they recurred.

LICHEN SCROFULOSORUM.

DR. GRIANDON (*Ibid.*) reports a case in a lady, aged twenty years, of the rare disease (in this country) of lichen scrofulosorum, occurring as a number of dark-red, hard, small papules, arranged in crescents and segments of circles, resembling the small, miliary, papular syphiloderm. There were no symptoms of tuberculosis.

TREATMENT OF ALOPECIA AREATA.

DR. MORROW (*Ibid.*) discusses the treatment of alopecia areata, stating his belief that the vast majority of cases of typical alopecia areata were caused by a specific germ, the microscopical characters of which and the conditions which favor its propagation being as yet unknown. The hairs around the border of the patches are closely clipped, and, if they yield readily, are to be extracted with forceps. In recent cases chrysarobin, 8 to 10 per cent., and salicylic acid, 2 to 5 per cent., are recommended, in liq. gutta-percha or lard, applied every three or four days in sufficient strength to maintain a moderate dermatitis. Equal parts of acetic acid and chloroform are also well spoken of; also, chloral 5 grammes, officinal ether 25 grammes, and acetic acid (crystal) 1 to 5 grammes, repeated two or three times a week. In the intervals a stimulating oil once a day, as oil of euca-

lyptus and oil of turpentine, each half an ounce, crude petroleum 1 ounce, alcohol 1 ounce, together with massage, are employed. Sulphur, resorcin, and salt-water frictions are also useful.

DR. BULKLEY (*Ibid.*) calls attention to a method of treatment that he has for a number of years employed satisfactorily, which consists in the thorough application of carbolic acid, 95 per cent. strength, rubbed into the patches one or more times. It is a little painful at first, but the second application is not often complained of. It should not be used on more than two or three square inches at one sitting, several days being allowed to elapse before another touching. Bulkley is not a believer in the parasitic nature of the disease.

MOLLUSCUM CONTAGIOSUM.

DR. GRAHAM (*Ibid.*) relates the history of an outbreak of this disease in the Toronto Infants' Home, the epidemic lasting three years and attacking fifteen children. The conclusions drawn were: 1. That the disease is contagious; 2. That it is conveyed by direct contagion; 3. That those who suffer extensively from molluscum contagiosum do not seem so liable to again contract the disease.

HISTOLOGY OF MOLLUSCUM CONTAGIOSUM.

DR. MACALLUM's studies (*Ibid.*) show that the molluscum growths take their origin in the stratum mucosum of the epidermis. The "molluscum corpuscle," which plays such an important part in the pathology of the disease, should be applied only to the peculiar hyaline body inside its containing epithelial cell. These corpuscles are elements which arise in the epithelial cells of the lower layers of the stratum mucosum, and at first are not larger than the plasmasomata (nucleoli) of the same or neighboring cells. In some preparations the nucleoli can be seen undergoing extension from the nucleus or migrating therefrom. During the passage of the epithelial cell outward the corpuscle enlarges, and its homogeneous substance becomes transformed into a more or less coarsely granular material. The large size of the corpuscle now forces the cell nucleus to one side and flattens it, while the cell protoplasm around the corpuscle now forces the cell nucleus to one side, the cell protoplasm around the corpuscle finally becoming merely a membrane. The origin, the increase in size, and the peculiar changes which the corpuscle undergoes all indicate that it is a cellular product and not a parasite (psorosperm).

MYCOSIS FUNGOIDES.

DRS. STELWAGON and HATCH (*Ibid.*) report two cases of this disease, one a Russian woman, aged forty-three years, the other a native farmer, aged thirty-nine years. In one case there existed precursory erythematous and eczematous symptoms concomitantly with the appearance of the characteristic tumors and fungoid growths. Death ensued a year after the beginning of the disease. In the other case, precursory erythematous, eczematous, and urticarial lesions existed for a period of ten years, the smaller tumors appear-

ing eighteen months before his death. In neither case was the lymphatic system involved.

In one case an autopsy was obtained, which showed no tumor invasion of the internal organs. The cutaneous growths were made up of small, lymphoid cells reposing in a fine embryonic connective-tissue stroma. From the clinical, histological, and bacteriological studies of these two cases they may be classified as "specific granulomata," for the reasons that the process is a proliferative, eliminative one characterized by the production of tumor foci poor in blood-supply and readily undergoing cheesy degeneration. These tumor foci are made up of lymphoid cells lying in loose meshes of an embryonic connective-tissue framework; the small round cells are collected around the bloodvessels as in syphilis, and peculiar microorganisms are present in the tissues, and are capable of cultivation upon nutrient media.

VALUE OF EPILATION.

DR. ZEISLER (*Ibid.*) discusses the value of epilation as a dermato-therapeutic measure, the advantages gained by its use consisting in the removal of the several parasitic elements which may be imbedded in the hair-shaft; in the laying open of the follicles which permits of a deeper-reaching effect of the parasiticide used, and in removing a source of irritation of the surrounding tissues. The diseases for which the method is recommended are the different forms and localizations of sycosis, favus, tinea tonsurans, tinea sycosis, pustular (sycosiform) eczema, and alopecia areata.

TUMENOL AND ITS USES IN SKIN DISEASES.

PROFESSOR A. NEISSER, of Breslau (*Deut. med. Wochenschr.*, 1891, No. 45), has made use of this remedy for the past two years, and recommends it as valuable in the therapy of eczema, especially as an antipruritic. It is obtained from mineral oil by the action of sulphuric acid, and, while similar, is different from ichthyol. In concentrated form it is black, the odor not objectionable. In tumenol two substances are present: 1. Tumenol-sulphur, always of oily consistence, and designated "tumenol oil;" and 2, tumenol-sulphate, known as "tumenol powder." The former is insoluble, the latter soluble in water. A tincture may be prepared from tumenol powder, in two forms, as the following:

R.—Tumenol	.	.	.	.	.	.	.	.	5 parts.
Ether	.	.	.	.	.	.	.	.	15 "
Alcohol	.	.	.	.	.	.	.	.	15 "
Water [or glycerin]	.	.	.	.	.	.	.	.	15 "

That containing water dries quickly. That with glycerin may be followed by some dusting-powder with advantage. For salves, pastes, and plasters the tumenol oil is to be preferred. The remedy has been found useful in moist, subacute eczema, and in burns of the first and second grades. It affects chiefly the superficial cutaneous strata. It allays itching not only in eczema, but also in the parasitic inflammations, and in prurigo and in pruritus—in the latter diseases, especially in the form of the tincture. In eczema with fissures, as about the anus and scrotum, it proves valuable.

It is also useful in superficial and deep ulcerations, and in leg ulcers. It is not a parasiticide. Upon the general organism it does not seem to exert any injurious effect.

AN EPIDEMIC SKIN DISEASE.

THOMAS SAVILL (*British Medical Journal*, December 5, 1891), Medical Superintendent of the Paddington Infirmary, reports an unknown form of cutaneous disease occurring epidemically in that institution, 163 out of 846 inmates (nearly 20 per cent.) being affected during a period of five months. Only one case was brought into the infirmary with the disease. As a cause of the eruption, food, soap, water, and scabies were excluded. The notes of four typical cases (with one colored portrait and photographs) are given. The eruption is in its essence a dermatitis of more or less general distribution, which commences usually with discrete papules, which sometimes go on to the formation of vesicles, and always results in very extensive desquamation or exfoliation of epidermis. It is attended by a certain amount of constitutional disturbance, and runs a more or less definite course of about seven weeks. Sometimes maculæ, resembling German measles, which become confluent, forming a uniformly thickened, crimson skin, with the characteristic scales in flakes, occurred; but the usual form was papulo-erythematous. A dry and a moist type were noted, the latter bearing some resemblance to eczema, but with more thickening of the skin, and with profuse serous exudation. The disease was liable to relapse, or, more strictly speaking, to recrudescence, 38 out of the 163 cases being so affected. The hair and nails were generally shed. The two most constant constitutional symptoms were anorexia and prostration. The temperature tended to be subnormal except when the inflammation was at its height. The mortality was 12 per cent., and was chiefly among males, and those advanced in years. Children were almost exempt. In the early stages, antiseptics, such as creolin, seemed to have a marked controlling influence, but in the later stages these were powerless. The essential predisposing conditions for its occurrence seemed to be advancing years and debility from sickness, "hospitalism," or other cause. The disease bore some resemblance to pityriasis rubra.

ETIOLOGY OF ITCHING.

DR. E. B. BRONSON, of New York (*Medical Record*, October 24, 1891), takes the ground, in an admirable and exhaustive article, that pruritus, like neuralgia, tinnitus or photophobia, is only a sensation, and, therefore, only a symptom. It is the sensory manifestation of some morbid change unaccompanied by visible alterations. It is a nervous derangement involving some molecular change that disturbs normal relations. A factor of importance in the production of excessive itching, nearly always present, is a state of cutaneous hyperæsthesia. This is a peculiar morbid state in which all the senses are coördinately exaggerated. It is an abnormal condition unfavorable to the highest functional activity of any organ. The causes of itching may be divided into—1, predisposing, and 2, exciting. In the first class, itching may occur as the local expression of a general neurotic condition, which may be either congenital or acquired. It may also be due to local changes in the

skin, attended with prolonged irritation of the cutaneous sensory nerves; or it may be caused by a state of impaired conduction in the cutaneous nerves of tactile sense. Though usually occurring with hyperæsthesia of the skin, it may exist independently of the latter, as in pruritus senilis. The exciting causes are either irritations conveyed to the skin from the interior of the body, as reflex irritations or irritations transmitted from nervous centres; or direct or local irritants, from extraneous sources, or originating within the skin, as in the case of trophic skin diseases. To the latter class also belong those cases where itching is due to toxic or noxious substances deposited from the blood. It may also arise from local nutritive disturbances or deranged metabolism in the cutaneous sensory nerves.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

THYROIDITIS.

M. GERARD-MARCHAND, of Paris, has observed (*Rev. de Lar.*, etc., 1 Mai, 1891) an instance of spontaneous thyroiditis in a hypertrophied gland, in which bacteriological examination of the pus revealed the presence of pneumococci.

THYROIDECTOMY.

M. A. REVERDIN, of Genoa (*Ibid.*), reports a series of 14 operations: 10 in females, 4 in males. The average sojourn in the hospital was eight days. One patient succumbed—the only one he ever lost. In this subject the trachea was in a state of great softening. Reverdin operates by a large incision along the anterior border of the sterno-mastoid muscle, with lateral extensions, if requisite. The muscles are divided and sutured after the extirpation. Superficial vessels are gently secured between pincettes and then divided. Either enucleation or partial extirpation is practised according to the conditions present. Total extirpation is no longer practised.

THYREOTOMY IN AN INFANT, EIGHTEEN MONTHS OLD.

DR. CLINTON WAGNER reports (*N. Y. Med. Journal*, 1891, No. 675) a successful case with removal of a papilloma, the size of a small pea, from the posterior portion of the left vocal band. Tracheotomy had been performed two weeks earlier for laryngeal dyspnœa, which became immediately relieved. Circumstances unconnected with the clinical history of the case

prevented the proposed removal of the canula, but the patient breathed comfortably through the larynx with the orifice of the tube plugged, and his voice was returning, when he died from an attack of influenza eleven months after the operation.

HYSTERICAL APHONIA CURED BY COMPRESSION OF THE OVARIES.

DR. HIGGUET, of Bruxelles, reports (*Rev. de Lar., etc.*, 1891, No. 18) a case of hysterical aphonia cured in about three minutes by slow and progressive compression of the ovaries as recommended by Jonquiere (*Monats. f. Ohren.*, June 6, 1890), after several weeks of failure with constitutional treatment, electricity, and cold douches. Slight recurrences have taken place at the menstrual periods and under emotional excitement, but they have subsided in a few days without treatment.

Higguet attributes the aphonia to paralysis of the group of inter-arytenoid muscles, and he believes that compression of the ovaries causes spasm of these muscles, and thus overcomes both the paralysis and the aphonia. He states that traction on the ovaries in abdominal surgery frequently produces spasm of the larynx.

ADENOID VEGETATIONS OF THE RHINO-PHARYNX.

DR. DELIE, of Ypres, relates (*Revue de Laryngologie*, No. 18, 1891) the clinical history of a lad thirteen years of age, from whom he removed some adenoid vegetations with complete relief from all the disagreeable symptoms. Some two months later nasal obstruction gradually recurred, with spontaneous epistaxis gradually increasing in amount and in frequency. Large tumors were found in both choanæ, one of which filled the posterior third of one of the nasal cavities. Another tumor occupied the entire rhino-pharynx. These neoplasms bled freely on the contact of the exploratory stylet. Histological examination of fragments removed for that purpose, revealed nothing more than hypertrophied adenoid tissue, although sarcoma was suspected. These growths were removed by electro-caustic procedure, and the cavities were well scraped. A second recurrence was thoroughly eradicated. Again recurrence with rapid growth, and with submaxillary enlargements. Then electrolytic treatment. Histological examination revealed globocellular sarcoma. Finally terrific cephalalgia, vertigo, and sudden death.

The author regards the sarcomatous recrudescences as evidences of transformation, and intimates that diagnosis based upon microscopic examinations should not always supplant that based upon clinical features.

METHODS OF USING TRICHLORACETIC ACID IN THE NOSE AND THROAT.

DR. GUSTAV KILLIAN, of Freiburg, recommends (*Münchener med. Woch.*, No. 39, 1891) its use in concentrated solution or in the deliquesced condition in preference to the crystals, which are difficult to manage. A few crystals can be well shaken up with two or three drops of water. In this condition it is nearly as effective as when solid. It can be applied with a cotton wad firmly rolled around a probe or held in one side of a pair of forceps, so that

the metal only can come in contact with the sound tissues on the opposite side. A minute quantity suffices to paint over an entire turbinate body. Two such applications should be made in immediate sequence, and even more upon points of great swelling. The pain from the application is not so readily prevented by cocainization as electric cauterization is, and three or four applications of a twenty per cent. solution of cocaine are required.

The mucous membrane is rendered snow-white by the cauterization; and the eschar can hardly be distinguished from the eschar after electric cauterization, and it is cast off rather sooner. The parts heal without pain and without reaction, and the effects are as good as after burning. In the pharynx the pure acid has about the same effect as the silver nitrate stick.

CHRONIC DIPHTHERIA OF THE NOSE.

DR. LUIGI CONCETTI, of Rome, reports (*Rev. de Lar., etc.*, No. 20, 1891) a second instance of two months' duration without fever or other constitutional symptoms. Cultures produced numerous colonies of the bacillus described by Löffler. Dr. Concetti warns against considering such cases of chronic diphtheria as innocuous, and urges all the curative and prophylactic precautions employed in acute diphtheria. In the instance reported in 1886, the infant infected three other children and a servant in the same family, and the case was followed by paralysis of the pharyngo-laryngeal muscles.

SUPPURATION OF THE MAXILLARY SINUS.

DR. FRANZ BLOCH, of Heidelberg, reports (*Münchener med. Wochenschr.*, No. 34, 1891) some cases illustrating the operative procedures employed in the clinic of Professor Jurasz. The antrum is entered from the inferior nasal meatus with lance-pointed trocar, and irrigation is made through a double catheter-beaked canula, so as to provide for flushing the sinus by reflux in case the normal opening in the middle nasal meatus should be clogged. When the normal opening is accessible, that orifice may be utilized for the insertion of the canula.

NASAL TUBERCULOSIS.

DR. A. CARTAZ presents an instructive paper based upon the study of eighty cases from various observers. Seven cases were under his own care (*Gaz. hebdom.*, No. 18, 1891). Primitive tuberculosis of the nasal passages is rare, the large majority of instances occurring in the subjects of more or less advanced pulmonary tuberculosis. Direct inoculation is viewed as the main etiological factor, possibly by the contact of portions of sputa expelled by cough, certainly in a few instances by the use of pocket-handkerchiefs into which the patient has expectorated. Two forms of manifestation prevail, ulceration and the formation of a tumor. Miliary granulation is said not to have been observed, probably because its presence does not give rise to symptoms driving the patient to a physician. Nevertheless, it is probably the first step in the process. The ulceration, often unique, usually occupies the septum or the furrow between the septum and the floor of the passage. Sometimes it occupies the turbinate bodies, sometimes the posterior extremity

of the middle and lower turbinates. Its extent varies from the size of a ten-cent piece to that of a twenty-five-cent piece, its form being more or less rounded and oval. The floor is usually pale grayish-red, and is covered with some viscous muco-pus or with thin crusts. Caseous masses are fixed on some anfractuositities of the ulcer, while fine grayish granulations at other points represent miliary tubercles not yet softened. The borders are sometimes raised and sometimes irregularly dentated. Yellow tuberculous points are sometimes seen at the periphery or immediately adjacent, representing the early phase of subsequent similar ulceration. In some cases tuberculosis of the pharynx, soft palate, or the tongue occurs at the same time. Pain is rarely severe. In the second form, the tumor is usually developed at the anterior portion of the septum. It is usually sessile or has a large pedicle. It may vary from a minute size to a bulk sufficient to occlude the passage. It is pale red and often bosselated. In some instances it is soft, in others hard. Its surface may present perforations through which the probe penetrates into a fungous, caseous tissue, a veritable cold abscess in process of regression. The tumor may be bilateral, and two such tumors may communicate, but the septum does not undergo perforation.

In both varieties the course is slow. Primitive cases may be thoroughly cured, and pulmonary tuberculosis follow without any recurrence at the original seat of lesion. Extension is progressive and continuous unless arrested by treatment, but does not acquire the acuity noted in the pharynx, the larynx, and the lung.

The treatment consists in thorough curetting, preceded by ablation of any tumors, and cauterization with the electric cautery, lactic acid, chromic acid, zinc chloride, or some other agent. These operations should be completed at one sitting when practicable. Cocainization should precede and tamponing follow. Cotton-wad impregnated with vaselin surcharged with antipyrine and with salol is recommended as an antiseptic and a perfect hæmostatic.

As a matter of course, antiseptic washes should precede and follow the surgical intervention, and appropriate hygienic and medicinal treatment be instituted.

DEVIATIONS OF THE SEPTUM NARIUM.

A case of deviation spontaneously corrected by a traumatism is reported by DR. POTIQUET (*Rev. de Lar., etc.*, 15 Avril, 1891).

The condition was discovered post-mortem. The fracture had taken place from above downward, and one of the broken ends of the septum was found superposed on the other, correcting the deformity which must have existed before the accident.

IMPAIRMENT OF VOICE DUE TO MUCOUS HYPERTROPHIES OF THE POSTERIOR SEGMENT OF THE NASAL SEPTUM.

DR. RAULIN, of Marseilles, reports (*Rev. de Lar., etc.*, 1891, No. 10) impairment of voice in a singer and in a clergyman due to thickenings of the soft tissues on both sides of the posterior portion of the vomer, and completely relieved by electro-caustic destruction of the hypertrophied masses.

[Similar instances have not been infrequent in the experience of the compiler. The trouble is physical and not reflex. The resonance is impaired and can no longer accord with the higher tones of the register.—Ed.]

TUMORS OF THE TONSIL.

M. LEFOUR reports (*Journ. de Méd. de Bordeaux*, 1891, No. 38) a case of fibrous polyp developed during pregnancy, and refers to two instances in which he saw epulis developed in the mouth under the influence of pregnancy, and also to an observation by Professor Coyne of the development of a vascular tumor of the interior of the lower lip developed under similar conditions. M. Arnozan has likewise observed an instance of epulis in two situations under similar conditions with retrocession and disappearance after delivery.

OBSTETRICS.

UNDER THE CHARGE OF

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THE STUDY OF UMBILICAL INFECTION IN ONE THOUSAND INFANTS.

In the *Archiv für Gynäkologie*, Band xli., Heft 3, ERÖSS publishes his results from the study of umbilical infection in 1000 infants. Careful measurements of temperature in these cases showed a large number of febrile patients, in most of whom no disease was evident. In only 32 per cent. were normal and undisturbed drying and cicatrization of the cord and umbilicus observed. In 14.7 per cent. inflammation of the connective tissue about the umbilicus was present.

After comparing various methods of treating the cord, it was found best to leave it not longer than three-fourths of an inch, to ligate with linen tape which had been thoroughly impregnated with bichloride of mercury, and to envelop the stump in a dry dressing, of a piece of clean, dry linen cloth. It was also found useful to cleanse the tissue about the umbilicus with 1 : 1000 bichloride, envelop the cord in sterile cotton, and cover the dressing with sheet rubber, to protect it from contamination. It is better not to bathe an infant by dipping it into water until after the umbilicus is healed.

Although gangrene of the umbilicus rarely occurred, yet septic infection through this channel, with subsequent complications, was not infrequent. The mortality from this source in two large clinics is stated at 25 and 30 per cent. Of these, 70 per cent. showed no symptoms of external inflammation, while 50 per cent. presented inflammation of the umbilical vessels.

In preventing umbilical sepsis the greatest importance is laid upon a rapid and complete drying of the stump of the cord. Next in value is thorough cleanliness. In hospitals, those nurses who attend lying-in women should not care for their infants; all obstetric nurses should pay especial regard to the antiseptis and cleanliness of the umbilical region of the newborn. It is curious to observe that the mothers of these infants showed no signs of puerperal sepsis.

A CONTRIBUTION TO THE STUDY OF PUERPERAL ECLAMPSIA.

GOLDBERG, of Dresden, in the *Archiv für Gynäkologie*, Band xli., Heft 3, and Band xli., Heft 1, draws interesting conclusions from 81 cases of eclampsia. Although more frequent in primigravidæ, the mortality is much greater in those who have borne children. Eclampsia beginning in pregnancy is most fatal; least so when it commences in the puerperal state. Profound disturbance of the nervous system is a more unfavorable symptom than the albuminuria, dyspnœa, cyanosis, and bad pulse. The most successful treatment is speedy delivery. The forceps is especially successful for mother and child. Version and extraction were also successful. Craniotomy was less valuable as a means of treatment. Cæsarean section was followed by septic peritonitis and death. Induction of labor was successful, as was also incision of a rigid os and extraction. Hot baths and packs, chloroform, chloral, and morphine were reliable agents. Large doses of morphine should be avoided, as collapse sometimes follows their use.

THE CONDITION OF THE KIDNEYS IN ECLAMPSIA.

In the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxiii., Heft 1, PRUTZ describes in detail the condition of the kidneys in 22 cases of fatal eclampsia. While acute and chronic processes were present in many, in many others there was no pathological condition in the kidneys sufficient to account for the eclampsia. In many cases congestion and transudation of serum seemed the condition present. Microorganisms were absent. There was no relationship between the severity of the eclampsia and the extension and severity of the pathological lesions in the kidneys: many of the severest cases of eclampsia showed but slight alterations in the kidneys.

In the kidneys of infants born during eclampsia were found an absence of inflammation; epithelia intact; a great number of hyaline casts and enormously distended veins; infarcts of uric acid were also present. The lesions seemed to be those of intense congestion and transudation of serum.

THE BACTERIOLOGY OF ECLAMPSIA.

GERDES (*Münchener med. Wochenschr.*, No. 22, 1892) describes the bacteriological examination of an interesting case of eclampsia in which extensive lesions of the kidneys and liver were present. He cannot account for the condition except as the result of an infective process, some of whose germs he isolated and describes. Further light can be shed upon the causation of eclampsia by the study of infective processes and the relation of bacteria to them.

THE CONDITION OF THE LIVER IN ECLAMPSIA.

PILLIET and DELANSORME report (*Bulletins de la Société Anatomique de Paris*, No. 8, 1892) an interesting case of eclampsia in which the liver showed complex alterations in connective tissue, vessels, and parenchyma. The lesion was hemorrhagic hepatitis, with extensive parenchymatous necrosis.

THE DIAGNOSIS OF THE KIDNEY OF PREGNANCY AND NEPHRITIS IN THE PREGNANT WOMAN.

In the *Prager med. Wochenschrift*, No. 17, 1892, FISCHER finds that the urine from the kidney of pregnancy contains formed elements in moderate amount during the last four or five weeks of pregnancy, rapidly disappearing after labor. Leucocytes; $\frac{3}{100}$ of 1 per cent. of albumin; hyaline and a very few granular casts, and red blood-corpuscles, are not a ground for changing the diagnosis. Red blood-corpuscles in considerable amount, occurring early in pregnancy and suddenly increasing, indicate acute nephritis. Granular and epithelial casts indicate chronic nephritis; hyaline casts alone are of little moment.

Seventy cases were examined; in 58 the kidney of pregnancy was found during the second half of pregnancy. Nephritis of pregnancy was diagnosed in 8.

SUDDEN DEATH DURING THE PUERPERAL STATE.

EHRENDORFER (*Wiener medizinische Presse*, 1892, Nos. 20 and 21) calls attention to fatty degeneration of the heart muscle as a not infrequent complication of pregnancy, and describes a case of sudden death in a puerpera from thrombosis of a cerebral sinus occurring in connection with fatty heart. The patient was a young primipara whose labor was normal. On the tenth day after labor she left her bed, and on the eleventh day she was suddenly seized with syncope, headache, and sensations of cold. She afterward vomited, had unequal pupils, convulsions, paralysis, contractures, and symptoms of profound depression in the central nervous system. A moderate rise in temperature occurred also. Death ensued seventeen hours after the first attack of unconsciousness. The post-mortem revealed an entire absence of septic infection and inflammation; no abnormality was discovered in the pelvic organs. Simple thrombosis of the falxiform sinus and veins of the dura and pia mater, with subdural and inter-meningeal hemorrhage, was present.

A second case of fatty heart and sudden death is also reported in a young primipara who was delivered of twins with forceps. Although delivery was not difficult, she collapsed an hour afterward and died. The placenta was adherent and required manual removal. Fatty degeneration of the heart, with the general lesions which accompany it, was found at the autopsy.

But little can be done to prevent death in these cases. The patient should be spared all possible strain during pregnancy and given appropriate tonics. Labor should be expedited so far as possible. Camphor and musk may be used by injection. Anæsthetics may be cautiously employed to advantage, combined with manual delivery. To prevent the sudden fall in intra-abdom-

inal pressure a bag of sand weighing several pounds may be placed upon the abdomen after delivery. Some of the cases, not explicable by post-mortem lesions, are probably caused by reflexes from lesions or injuries of the nervous supply of the genital organs.

WHAT CONSTITUTES ESSENTIAL OBSTETRIC ANTISEPSIS?

VEIT replies to this question in the *Berliner klinische Wochenschrift*, Nos. 20 and 21, 1892, as follows: As prophylaxis, doctor and nurse should wear clean clothing; the patient should have a bath when possible; the external parts should be invariably cleansed with soap and water by a clean hand. The hands of the obstetrician or midwife, and the patient's external parts, should be disinfected before each internal examination or operation, and also just before the exit of the child. Disinfection of the internal parts is never necessary under normal conditions. Disinfection, either external or internal, is unnecessary after normal labor. Internal examination should be as infrequent as possible, and should be made by sight, the finger never being passed over the perineum into the vagina.

An occlusion napkin or dressing does not maintain an aseptic condition, but absorbs the secretion and thus furnishes a means of diagnosis. Sterile gauze should be always available, but is rarely needed.

In the Dresden Obstetrical Clinic, LEOPOLD and GOLDBERG (*Deutsche medicinische Wochenschrift*, No. 13, 1892) have omitted all vaginal injections for several years. The result has been a marked decrease in morbidity and mortality, from sepsis and other causes. They, therefore, rely as much as possible on external examinations only, with careful external antisepsis, omitting all injections in normal cases.

COMPLETE INSTRUMENTAL ABORTION FOR PREGNANCY COMPLICATED WITH AORTIC DISEASE.

DOLÉRIIS (*Nouvelles Archives d'Obstétrique et de Gynécologie*, 1892, No. 5) reports the case of a primigravida, suffering from aortic insufficiency, in whom a fatal prognosis had been given should pregnancy occur. Her condition was one of extreme prostration, with vomiting and threatened collapse. After careful preparation by bichloride douches and tampons of iodoform gauze, two days were spent in gradual dilatation of the uterus with laminaria tents. Under opium, but without an anæsthetic, the uterus was gently but thoroughly curetted with a sharp curette and the entire ovum removed. An intra-uterine douche was given and a tampon of gauze was applied. Uninterrupted recovery followed, menstruation recurring three weeks after the operation.

THE TREATMENT OF CIRCUMSCRIBED TUBAL PREGNANCY.

GUSSEROW (*Berliner klinische Wochenschrift*, 1892, No. 22) reports 13 cases of tubal pregnancy in which sudden rupture and hemorrhage occurred, with great danger to life. In 10 there was no apparent cause for rupture; in 1 case it followed curetting the uterus; in 1 a difficult defecation, and in 1 an

examination. The discharge of decidua was not present as a diagnostic sign; in 8 cases a fœtus could be found; in 5 the microscope detected villi of the chorion. Although these patients were in collapse when operated upon, 11 recovered; 1 died thirty days after operation from an old kidney lesion, the other perished in collapse.

He also reports seven cases of tubal pregnancy with retro-uterine hæmatocele which were under observation for some time before rupture and in which the patients' condition was never threatening so long as they remained quietly in bed. Six of these patients recovered after operation, one died of acute anæmia.

From these cases Gusserow concludes that laparotomy should be invariably performed as promptly as possible whenever symptoms of intra-abdominal or pelvic hemorrhage appear. Patients should be taken to surgical hospitals whenever possible. Where retro-uterine hæmatocele is present the patient may be kept under observation, if she remains quietly in bed. Cases of normal pregnancy, with small tumors near the uterus, do not call for laparotomy, and a positive diagnosis can only be made by keeping such a patient under observation. It is important to ascertain whether the ectopic fœtus is living or not, in the same manner.

GYNÉCOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

THE ORIGIN OF THE GRAAFIAN FOLLICLE.

SCHOTTLANDER (*Prager med. Wochenschrift*, Nos. 2 and 3, 1892), arrives at the following conclusions as the result of his microscopical studies: Ova and follicular epithelium are both formed directly from the germ-epithelium. Waldeyer's ova-spheres are next formed. From these are developed, through ingrowth of the connective tissue, the following:

1. Pflüger's follicles, the true significance of which is not clear.
2. The typical primordial follicles.
3. Atypical primordial follicles, or those which arise secondarily, from which ova-cells are separated by ingrowths of connective tissue.
4. Follicles which are formed in the same way from the ova-spheres. Nagel's cells are ova-cells which are derived from the spheres and may be regarded as accessory ova; they soon degenerate.
5. Follicles which are formed by the separation of larger or smaller portions of Pflüger's pouches.

In the two latter ways ripe Graafian follicles are formed more rapidly than by the gradual growth of primordial follicles. These processes are not

repeated in the adult. Rarely collections of germ-epithelium, without ova, are found from which may develop cysts lined with epithelium.

The Graafian follicle becomes the seat of various retrograde changes. Atrophy is a physiological process in mammals. The nucleus undergoes simple atrophy or pigmentary degeneration; and an ingrowth of connective tissue from the *theca interna* leads to the formation of a cicatrix. When cicatrization is imperfect, as may occur in large follicles, epithelial cysts may result. The corpus luteum undergoes fatty degeneration, an overgrowth of fibrous tissue takes place, which may later contract. Later the corpus luteum becomes absorbed, and the connective tissue may be the seat of hyaline degeneration, which latter is also observed in the cicatrices of atrophied follicles.

SARCOMA OF THE URETHRA.

EHRENDORFER (*Centralblatt für Gynäkologie*, 1892, No. 17) describes and illustrates a case of round-celled sarcoma of the urethra which is almost unique, as Winckel mentions only one other case, of Beigel's. It is to be distinguished from the condition described by Thiem as "peri-urethral sarcoma." In Beigel's case the patient was a multipara, aged fifty, and the growth was of five years' standing, the initial symptoms being pain and hemorrhage after coitus, but no pain during micturition. In Ehrendorfer's case the patient was a multipara, aged fifty-two, who had passed the menopause eight years before. During the past year and a half an enlargement had gradually developed at the meatus urinarius, not attended with urinary symptoms. More recently a reddish, watery discharge had appeared, without odor. On examination several large fleshy folds or projections were seen protruding from the meatus. These were readily excised.

OPERATION FOR ACCESSORY URETER.

BAUM (*Archiv für Gynäkologie*, Band xli., Heft 2), reports the case of a young girl, in whom the right ureter was double, one branch passing beneath the base of the bladder and opening at the side of the urethra, so that the patient was troubled with constant dribbling of urine. An incision was made above the symphysis, as in epicystotomy, and an opening was made in the floor of the bladder at a point where it was crossed by the aberrant ureter. The latter was then divided, the distal portion was ligated, and the proximal end was stitched into the incision in the bladder, the result being entirely satisfactory. This method of operating was adopted because the patient was a virgin; under suitable conditions it might be performed *per vaginam*.

DEVELOPMENT OF THE URETHRA AND PERINEUM IN THE HUMAN FEMALE.

NAGEL (*Centralblatt für Gynäkologie*, 1892, No. 17), as the result of his studies of embryos, has found that the cloaca, into which empty originally the gut and the canalis urogenitalis, is alike in both sexes, as are the first steps in the development of the urethra—indicated by the formation of the glans and the portion of the canal immediately adjacent to it. Later, the glans in the female retrogrades, and the epithelial furrow

at its side remains open, but later disappears entirely. The urethra is formed by the coalescence of the lateral walls of the cloaca. In the female the canalis urogenitalis disappears, a portion remaining corresponding to that part of the male urethra between the bladder and the ejaculatory duct. The external separation of the cloaca occurs by the union of its lateral walls posteriorly, through hypertrophy of the epithelium covering corresponding opposing surfaces.

TREATMENT OF PYOSALPINX BY ASPIRATION AND IRRIGATION.

NITOT (*Bull. et Mém. de la Soc. Obstet. et Gynécol. de Paris*, No. 7, 1892) calls attention to the fact that in many cases of pelvic suppuration it is not always possible to remove a diseased tube, so that the abscess must be packed and drained through the abdominal wound, with considerable danger to the patient. Vaginal hysterectomy performed for the same condition is generally regarded as too heroic an operation. Conservative surgeons recommend opening the abdomen and withdrawing the contents of a pyosalpinx without extirpating the tube. It seems more rational to do this by puncture *per vaginam*. The writer uses a large-sized needle and washes out the tube with a solution of bichloride after withdrawing its contents. With strict antiseptic precautions there is a minimum amount of risk, and laparotomy can be performed subsequently if desired.

MICROCOCCI IN THE PUS OF PYOSALPINX.

WITTE (*Centralblatt für Gynäkologie*, No. 23, 1892), referring to the fact that Wertheim in a large number of observations failed to find any bacteria in the pus from diseased tubes except gonococci, describes a case which seemed to prove the possibility of mixed infection. In a young woman with gonorrhœal vaginitis he found in the vagina both gonococci and streptococci, a fact which explains the septic infection sometimes noted in puerperal women with gonorrhœa.

ABDOMINAL AND PELVIC EMERGENCIES CAUSING DEATH.

IRISH and STONE, in an interesting medico-legal paper on this subject (*Boston Medical and Surgical Journal*, 1892, No. 25), refer to a number of cases of sudden death from non-traumatic abdominal and pelvic lesions. Among the causes mentioned are perforation of the bowel in ambulatory typhoid cases, and ruptured ectopic gestation—emphasis being laid upon the relative frequency of the latter condition.

THE RESULTS OF GONORRHOËAL INFECTION IN WOMEN.

ROSTHORN (*Prager med. Wochenschrift*, 1892, Nos. 2, 3) reviews the course of gonorrhœa in the female, which is favorable so long as it is confined to the vagina. When the infection has spread to the cervical canal it assumes a chronic form ("ascending" gonorrhœa), and is situated in the endometrium and tubal mucosa. Even when the patient is cured there remain the catarrh and adhesions, which give rise to menstrual disturbances. The influence of gonorrhœa upon pregnancy and the puerperium is more serious than stated

by Sänger. In the acute stage the writer recommends applications of iodoform and tannin, with injections of one per cent. solution of bichloride (the vagina being immediately dried). Cauterization of the cervical canal with fuming nitric acid may be of benefit, but intra-uterine applications are inadvisable. Sänger's prophylactic measures are highly commended.

DISCUSSION OF THE CERVIX.

KLEINWÄCHTER (*Wiener med. Presse*, 1892, No. 23) reviews the influence of Sims's teaching upon German gynecology, especially with reference to the treatment of sterility, and refers to the fact that discission was formerly regarded as a sovereign cure for sterility. It has taken a long time for gynecologists to grasp the fact that a woman may be childless without being sterile. Sterility is only present when a woman cannot conceive in consequence of some congenital or acquired obstruction, while childlessness may be due to some defect in the husband. Unfortunately, a want of consideration of this point has made gynecologists prone to find the female alone at fault, and this has made them induce many women to believe that discission was a sure step to pregnancy. The author reports at length thirty cases examined by him in which the operation had been done in former years without result, and shows in every instance that the operation was performed blindly and without an attempt to discover the true cause of childlessness.

[The history (if it could be written) of this operation would furnish a chapter of accidents which would serve to render it still more rare than it is now.—H. C. C.]

EPITHELIOMA OF THE CERVIX UTERI WITHOUT SYMPTOMS.

SIEGHEIM (*Deutsche med. Wochenschrift*, 1892, No. 24) reports the case of a woman fifty-nine years of age, who had passed the menopause ten years before. In making a rectal examination to determine the cause of obstinate constipation, Roye found advanced carcinoma of the cervix with involvement of the perimetrial tissues. The patient had not had any pelvic symptoms whatever, although the condition was evidently of long standing. The writer adds, that while the initial symptoms of uterine cancer are so obscure that the profession should be taught to make a local examination in every case in which a woman has slight hemorrhage, discharge, or pelvic pain, in the absence of symptoms it is, of course, impossible to recognize such a case as the one cited. Winter reports the case of a patient in whom epithelioma of the cervix was discovered by accident, and a radical operation was performed successfully; this fact led him to advise that all women should be examined periodically, which would, of course, be impracticable. At any rate, it is highly important that the general practitioner should, by overcoming his own dislike of gynecological manipulations, educate his patients to report the first symptoms of cancer, and submit to an examination.

CURETTING IN THE TREATMENT OF UTERINE FIBROIDS.

PICHEVIN (*La Médecine Moderne*, 1892, No. 23) pleads for the more frequent use of the curette in the palliative treatment of this condition, from the well-

recognized fact that the hemorrhage in these cases is due to hypertrophy of the endometrium. Successful cases are reported.

HYSTERECTOMY FOR FIBROID AND FIBRO-CYSTIC TUMORS OF THE UTERUS.

PÉAN (*L'Abeille Médicale*, 1892, No. 28) describes the method that he now adopts, which is briefly as follows: After opening the abdomen and drawing out the tumor with a hook, its pedicle is encircled with a rubber cord, and the mass is excised above it. If there are several lobes, each is constricted with a separate cord and removed. If the bladder and rectum are adherent, they are dissected off. An *écraseur*-wire is then applied below the cord and the stump is trimmed down still further. The cervix is then removed *per vaginam* in pieces (*morcellement*), the broad ligaments being secured with forceps, as in vaginal hysterectomy.

CONGENITAL ABSENCE OF THE KIDNEY AND URETER.

NOEL (*Bull. de Société Anatomique de Paris*, May, 1892) reports the case of a woman, aged sixty-two years, who died of pulmonary trouble. At the autopsy the left kidney was found in its normal position, slightly hypertrophied and cystic, the ureter being normal. The right supra-renal capsule was found, but the corresponding kidney and ureter were absent, nor was there any trace of the right renal artery and vein. The bladder had only one ureteric opening; its capacity was four ounces. The case was a rare one, since the ordinary condition is fusion of the two kidneys with double ureter.

[The importance of this condition was demonstrated in a fatal case reported by Dr. Polk, in which the single kidney had been removed for disease.—H. C. C.]

THE CLOSURE OF VESICO-VAGINAL FISTULÆ FROM THE SIDE OF THE BLADDER.

TRENDELENBURG (*Deutsche med. Wochenschrift*, 1892, No. 23) reports two cases of extensive vesico-vaginal fistula operated on by this method, which is reserved for fistulæ which are inaccessible *per vaginam*.

In the first case, the patient being placed in Trendelenburg's posture, a transverse incision four inches long was made just above the symphysis, the bladder was exposed, and a transverse opening was made in it just below the reflexion of the peritoneum, which was extended to the left. The upper edge of the vesical wound was temporarily stitched to the corresponding edge of the abdominal wound, and the lateral edges of the vesical incision were held apart with sutures. The fistula was situated between the ureteric openings, somewhat to the left of the median line. The urethra and both ureters were catheterized. The edges were freshened as widely as possible, and four silk sutures were inserted transversely in such a way that they could be tied on the vaginal side. A T-shaped drainage-tube was introduced through the vesical wound, which was closed around it by a double row of catgut sutures (Lembert). The pre-vesical space was tamponed with iodoform gauze and the

external wound was closed, a space being left for the tube and gauze. The drainage-tube and vaginal sutures were removed on the tenth day, when some urine escaped through the external wound and some *per urethram*. A month after the operation the wound was entirely closed, and the patient could hold her urine for three hours. Six months later the patient was examined and was found to be perfectly well.

The second case was a particularly complicated one, since the uterus was fixed by exudation, and the vagina was much contracted by cicatricial tissue, the fistula being situated high up in the funnel-shaped vaginal vault, so that it was entirely inaccessible. A transverse incision was made as before, being extended to six inches, as the patient was quite fat. In order to gain more room the upper portion of the symphysis was resected, according to Bramann's suggestion. The bladder was exposed and a transverse incision was made in its anterior wall which extended entirely across it; this was carried still further to the right and upward. The ureteric openings were located and catheterized, and it was found that a uretero-vaginal fistula existed on the right side. The right ureter was then dissected away from the bladder to the distance of a third of an inch, the ureter being shortened to that extent. The edges of the vesical fistula were denuded and it was closed longitudinally by five catgut sutures, which were tied within the bladder. In order to maintain patency of the right ureter a fine whalebone bougie was passed into it through the urethra. The bladder was drained and the wound closed as before, and, lastly, the fragment of bone was replaced and sutured with silver wire. The operation lasted five hours, both chloroform and ether being used. The patient had no bad symptoms except a temporary elevation of temperature on the second day. The drainage-tube was removed on the ninth day, and a catheter was introduced *per urethram*, which was left *in situ* for two weeks, the bougie being removed from the ureter on the fourteenth day. Four weeks after the operation the patient was able to retain four ounces of urine and to pass it spontaneously, but the abdominal fistula was still open. The detached fragment of bone necrosed, retarding the healing of the wound for seven weeks, when the patient was discharged cured.

GONORRHOEAL SALPINGITIS.

CHARRIER (*Gazette Médicale de Paris*, 1892, No. 24) believes that at least 70 per cent. of the diseases of the adnexa are of gonorrhœal origin. The profession in general do not appreciate the fact that abortion soon after marriage, and sterility, are mainly due to this cause. If the importance of promptly treating specific vaginitis was recognized, many of its more serious consequences might be averted. The slight cases are more to be dreaded, since the vaginitis is not sufficiently severe to cause the patient to consult a physician before the inflammation has extended to the adnexa. It is highly important to make an early diagnosis. By prompt curettement of the uterine cavity in gonorrhœal endometritis, more good can be done than by any other treatment, since a focus of infection is eliminated and the spreading of the inflammation is prevented, with all its serious results—salpingitis, oöphoritis, and pelvic peritonitis.

was accompanied by cerebral symptoms of increasing gravity—cephalalgia, agitation, delirium, somnolence, and coma. After systematic use of the cold bath, according to the method of Brand, for two to four or five days, deferescence was reëstablished and progressed regularly to complete recovery.

The author refuses to accept, at least for his own cases, the theory of Gumprecht. He believes the phenomena due most probably to a violent excitation of the thermic centres caused by soluble poisons produced by the microbe of scarlatina and the microbes of secondary infection. He calls attention to what he considers a striking analogy between these phenomena and attacks of cerebral rheumatism, and recommends the persistent and systematic use of the cold bath, to which, he believes, his patients owed their lives.

TUMORS OF THE BLADDER IN CHILDREN.

PHOCAS (*Congrès Français de Chirurgie*, 1892, Procès-verb.) reports a case of vesical tumor in a boy of six and a half years. He has been able to collect the reports of 25 cases, which, with the five recently contributed by Albarran, give 30 cases, more or less carefully detailed. From a study of these data he draws the following conclusions:

Benign growths are less frequent than malignant. Among functional symptoms, hæmaturia has been noted only very rarely; troubles in micturition, however, are very frequent. From a clinical standpoint these tumors may be classified in two categories—depending upon the sex of the child. In girls the tumor rapidly dilates the urethra and protrudes at the vulva, rendering the diagnosis easy. In boys the bladder itself becomes dilated and appears to contain a large quantity of urine, but catheterization shows the liquid contents to be small. Bimanual examination usually reveals the presence of the neoplastic mass. In 12 cases in little girls operative measures have been resorted to, access to the bladder in the majority of cases being accomplished by way of the urethra. Only two of these cases were reported cured. After 7 operations in boys there were 5 deaths and 2 cures, the latter result being achieved in operations upon non-malignant growths.

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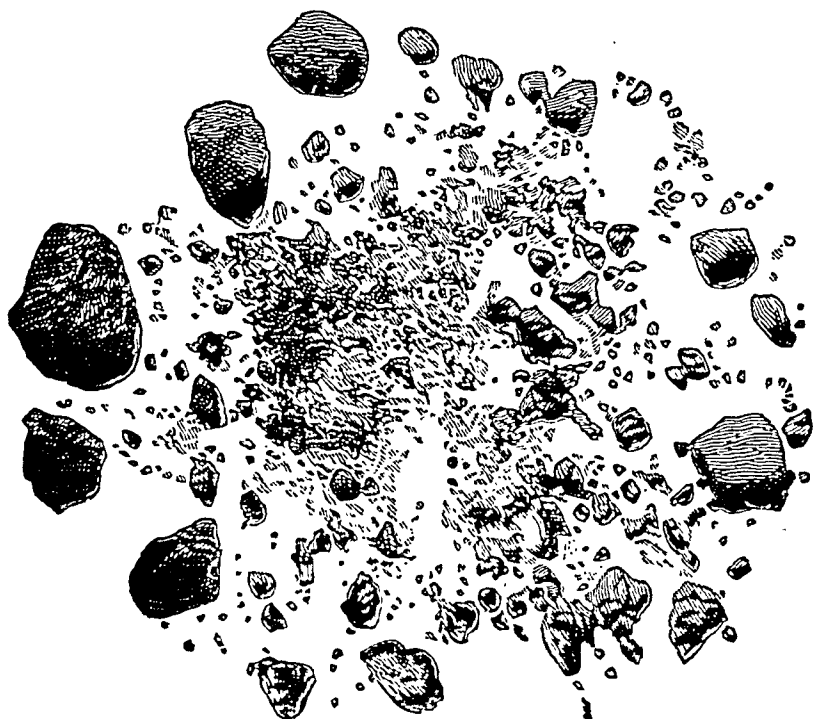
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STONE IN THE BLADDER.

By J. J. MAXFIELD, M. D.

A year ago Mr. A., fifty-one years old, consulted me for an old-standing and intractable cystitis, as he supposed and had been informed by two physicians. I suggested an exploration and readily detected a stone. It was a large one, and it was so hard that you could hear the click of the instrument in any part of my office. I advised that he should have an operation performed, but as his brother had died



after same operation a few years previously, he was afraid and refused to consent. In view to palliate, I ordered him to drink one quart of Buffalo Lithia Water every day. Washing out the bladder once a day with the same, warm, a careful attention to diet and bowels, with gentle tonics. This treatment was faithfully kept up for nine months, when pus appeared in the urine and the operation could no longer be

delayed. During the time he was under the treatment, large quantities of débris came away, some of the pieces were so large that it was only by great effort that they were passed via urethra. None of these were saved. The day before the operation, on the twentieth day of June, I examined him again, and the stone did not seem so large nor was the click so pronounced, though we could tell that there was a stone present by the grating as from a rough body. On the twenty-first, I did the left lateral operation, and after getting into the bladder, I introduced the forceps, grasped the stone and pulling it away I found it was like a mass of putty filled with sand. It was sacculated and there was a quantity of pus in the viscus. With forceps, gouge, curette and fingers I finally got it all away. No part of it was so hard but that it could not be crushed with very little effort between the fingers. After the fragments were allowed to dry they became hard.

The cut will illustrate better than I could tell how some of the mass looked, though a great deal of the finest particles were lost in the irrigation.

It will be noticed that there were very few large pieces, and these were so soft that they would drop to pieces on the slightest provocation. This friable quality showed me *why* I did not get so pronounced a sound at my second examination, nine months after the first. Had I known before I operated what I knew afterward, I would not have done it, but with a lithotrite I would have crushed it and washed it out, though I believe firmly that if I had continued the treatment of the Buffalo Lithia Water a few weeks more the stone would have fallen to pieces. The outer segments were roughened, showing the disintegrating action of the water in dissolving it. I believe the case is unique in every particular and shows the value of Buffalo Lithia Water so clearly that I thought it worth reporting. The patient made a complete recovery without an accident to mar it. The total weight of the pieces saved was 213 grains.—*The Prescription.*

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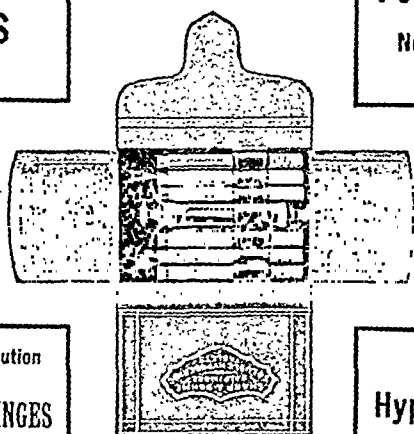
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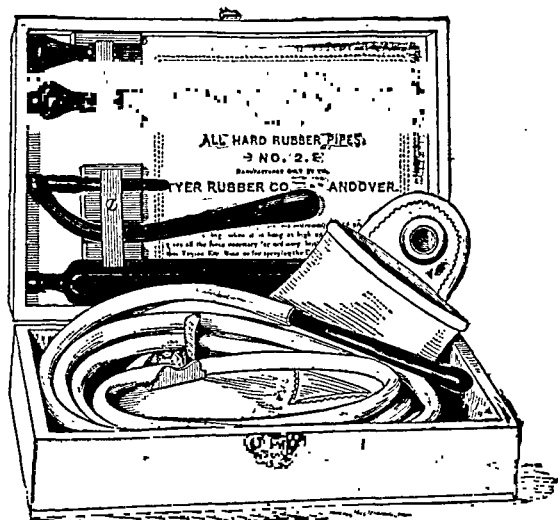
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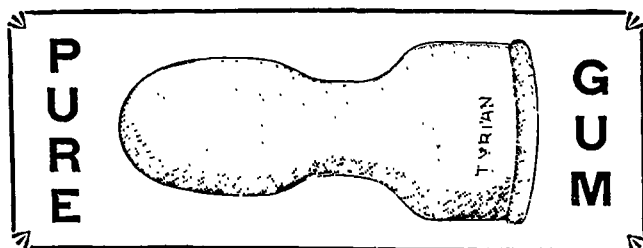
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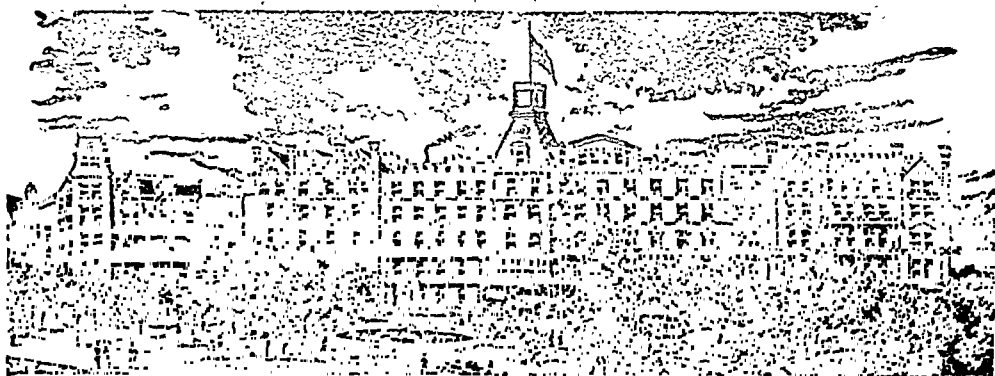
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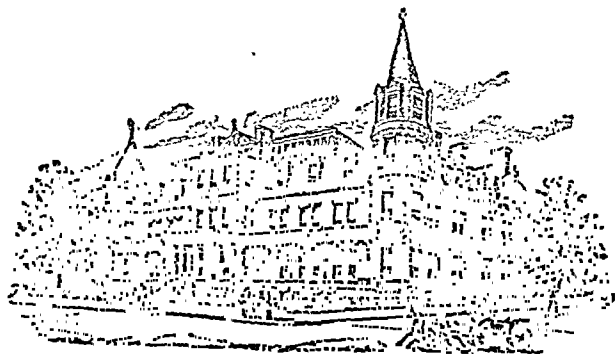
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
A Case of Enlarged Accessory Thyroid Gland at the Base of the Tongue. By J. COLLINS WARREN, M.D.	377
The Gastric Disorders of Phthisis, with Special Reference to the Causes, Pathology, and Treatment of the Symptom of Vomiting. By S. H. HABERSHON, M.D., F.R.C.P.	382
Fifty-four Cases of Molar Pregnancy. By THEOPHILUS PARVIN, M.D.	412
Treatment of Sacculated Aortic Aneurism by Electrolysis through Introduced Wire. Report of a Case. By D. D. STEWART, M.D.	422
The Relation of Microörganisms to the Diseased Endometrium. By ERNEST LAFPLACE, M.D.	438
Multiple Sarcomata. History of a Case showing Modification and Amelioration of Symptoms with Large Doses of Arsenic. By SAMUEL SHERVELL, M.D.	443

REVIEWS.

The Diagnosis of Diseases of the Nervous System: a Manual for Students and Practitioners. By Christian A. Herter, M.D.	450
A Manual of Diseases of the Nervous System. By W. R. Gowers, M.D., F.R.C.P., F.R.S.	450
A Text-book of the Practice of Medicine for the Use of Students and Practitioners. By R. C. M. Page, M.D.	453
Appendicitis and Perityphlitis. By Chas. Talamon	456
The Treatment of Empyema. By G. M. Debove and M. Courtois-Suffit	456
On Hare-lip and Cleft Palate. By William Rose, M.B., B.S. Lond.	456
Cardiac Outlines for Clinical Clerks and Practitioners, and First Principles in the Physical Examination of the Heart, for the Beginner. By William Ewart, M.D. Cantab., F.R.C.P.	457
On Common Neuroses, or the Neurotic Element in Disease and its Rational Treatment. By James Frederick Goodhart, M.D., F.R.C.P. Lond.	458

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Insanity After the Keeley "Cure"	459	Treatment of Subacute Cystitis	464
Turpentine in Typhoid Fever	459	Hay Asthma	464
Treatment of Perityphlitis	460	Sulphuric Ethers in the Urine	464
Case of Staphylococcæmia Primitiva	460	The Action of Salipyrin	464
Treatment of Facial Erysipelas	460	Asaprol	465
Hydrochloric Acid in the Treatment of Diseases of the Stomach	461	The Pambatanos	465
Treatment of Tuberculosis	461	Kola-nut	465
Treatment of Scrofula with Creasôte	462	Hydriodic Acid in Special Practice	466
Digitalis and the Pulmonary Circulation	462	Elimination of Creasote by the Urine	466
Treatment of Pneumonia	462	Salol in the Intestines of Dogs	467
Treatment of Pleurisy	463	Use of Salicylate of Soda for Sprains	467
On Posture and its Indications	463	Light as a Therapeutic Agent	467
Suspension in Tabes Dorsalis	463	Notes on Eucalyptus Oils	468
		Sarsaparilla	468

	PAGE		PAGE
Poisoning by Water of Javal	468	Treatment of Acute Tonsillitis	470
Treatment of the Uric-acid Condition	469	A Case of Cerebral Syphilis	470
Treatment of Alopecia	469		

MEDICINE.

Seat of Epileptic Disturbance	471	Unilateral Syringomyelia	476
The Urine in Phthisis	473	Primary Splenomegalia	477
Rötheln	474	A Case of Leukæmia and Diabetes	477
A Case of Osteitis Deformans	474	The Etiology of Leukæmia	478
Streptococcus in the Blood in Scarlatina	475	The Pathogenesis of Arthritic Mus-	
Specific Gravity of the Blood	475	cular Atrophy	478

SURGERY.

Epispadias in the Female	479	Removal of Necrotic and Carious Bone	483
Hæmatoma of the Fold of the Elbow	479	Gall-bladder Surgery	484
Cases of Gall-bladder Surgery	479	Restoration of the Inferior Maxilla	485
Amputation at the Hip-joint	481	Echinococcus Cyst of the Liver Oblit-	
Traction Splint in Hip-joint Disease	481	erated by Laparotomy and Drainage	485
Method of Treating Acute Urethritis	482	Club-hand of Congenital Origin	486
Cases of Cholecystotomy	483	Pleurisy and Thoracentesis	487

OTOLOGY.

Otitic Abscesses of the Brain	488	Salol in Suppuration of Middle Ear	499
Cerebral Complications of Otitis Media	489	Otological Section, American Medical	
Treatment for Relief of Chronic Sup-		Association	491
purative Affections of Middle Ear	490	American Otological Society	491

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Spasm of the Larynx	492	Keratoses of the Larynx	493
Laryngitis	493	Mixed Tumors	494
Tuberculosis of the Larynx	493	Congenital Occlusion of the Posterior	
Laryngeal Forceps	493	Nares	494

OBSTETRICS.

Preparation of Milk for Infant Feeding	494	Perforation of the After-coming Head	495
Ectopic Gestation	495	Rupture of Uterus during Abortion	496
Symphysiotomy	495	Abdominal Pregnancy	496

GYNECOLOGY.

Carcinoma and Fibro-myoma of Uterus	497	Saline Injections in Acute Anaemia	499
Retro-peritoneal Treatment of Stump		The Internal Crossing of the Ovum	499
after Supra-pubic Amputation	497	Combined Tuberculous and Gonor-	
Primary Cancerous Degeneration of		rheal Endometritis and Salpingitis	499
Uterine Fibro-myomata	498	The Position of Dermoid Cysts with	
Hysterectomy for Fibroid Tumors	498	Relation to the Uterus	500
Tubal Menstruation	498	Alcohol Injections in Carcinoma	500

PÆDIATRICS.

Cirrhosis of the Liver in Childhood	500	The Resorcin Treatment of Pertussis	502
---	-----	---	-----

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

OCTOBER, 1892.

A CASE OF ENLARGED ACCESSORY THYROID GLAND
AT THE BASE OF THE TONGUE.

BY J. COLLINS WARREN, M.D.,
OF BOSTON.

BENIGN tumors of the mouth and tongue are sufficiently rare to authorize careful study. The case reported here serves to throw light upon a group of growths whose etiology has hitherto been but imperfectly understood.

Mrs. L. E. S., fifty-two years of age, was sent to me in April, 1892, by Dr. F. I. Knight for treatment of a tumor of the tongue. She was born in Springfield. Her parents both died of consumption, but she herself has enjoyed good health, with the exception of two attacks of pleurisy—the last nine years ago—and is at present stout and strong, and is the mother of three children, all of whom are well. She first noticed a lump in her throat about twenty-two years ago, shortly after her youngest child was born. She was at that time suffering from a “bronchial” affection, and a physician who examined her throat discovered the tumor. Since that time it has been slowly but steadily increasing in size. During an attack of grippe this winter the tumor became swollen and inflamed, and after that the lump seemed to settle back into the windpipe, and has since caused considerable irritation, obliging her to hawk and spit constantly.

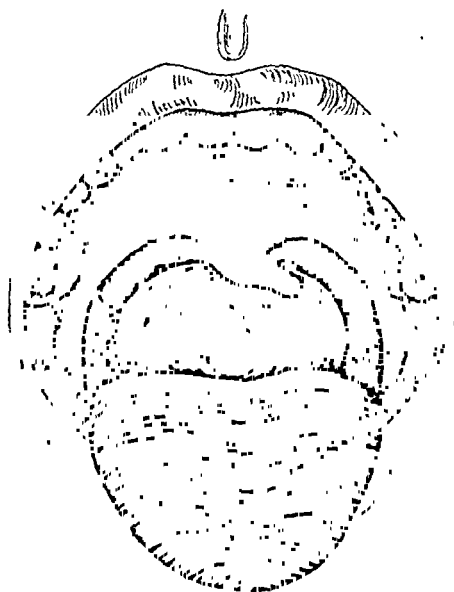
The catamenia ceased about five years ago, but no special change in the tumor occurred at that time.

An examination of the throat showed a tumor about the size of a hen's egg (Fig. 1), situated at the base of the tongue. An examination with the laryngoscope by Dr. Knight showed that it was in no way connected with the epiglottis.

On introducing the forefinger the posterior surface of the tumor could be reached, with some difficulty, and the existence of a space between it

and the epiglottis could be determined. It was covered with normal mucous membrane, and a tortuous vessel of considerable size could be seen running over the anterior surface. The tumor appeared to occupy the lower portion of the pharynx when the parts were quiescent, and it was only by drawing the tongue forcibly forward that it could be brought well into the view. Removal was advised, and the operation was performed May 4, 1892. After etherization a ligature was passed through

FIG. 1.



Showing position of tumor with tongue protruding as far as possible.

the tip of the tongue and the jaws were held open by a gag. As the tumor could not be drawn forward into the cavity of the mouth in this way, two additional ligatures were passed through the dorsum of the tongue on either side of the tumor in the region of the papillæ circumvallatæ. Traction brought the whole tongue forward, so that the tumor presented between the incisor teeth and could be easily operated upon.

An incision was made on the median line, and the tumor was with slight difficulty enucleated from its position. It appeared to be situated just beneath the mucous membrane, and did not involve the substance of the tongue. A portion of the redundant mucous membrane was excised on either side and the edges of the wound were brought together with catgut sutures. Three vessels required ligature—one of them being of considerable size. The patient made an uninterrupted recovery, and two weeks later returned to her home in Springfield. The patient was seen August 11th. There was no sign of a return of the tumor.

The following is the report of Dr. W. F. Whitney, of the Harvard Medical School, upon the microscopical structure of the tumor:

“The tumor, which had been somewhat torn during removal, was a rounded, slightly lobulated growth, the size of a small plum. The outer

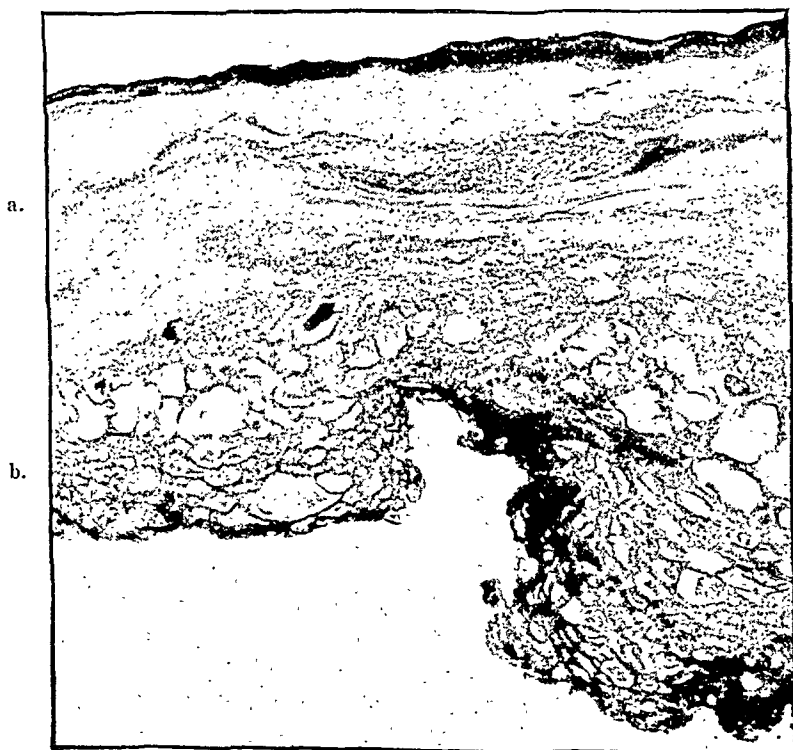
surface was in general smooth and fibrous. The section surface was of a reddish-yellow color, slightly translucent, and marked by minute cysts filled with a viscid yellowish colloid material.

FIG. 2.



Microscopical section—high power.

FIG. 3.



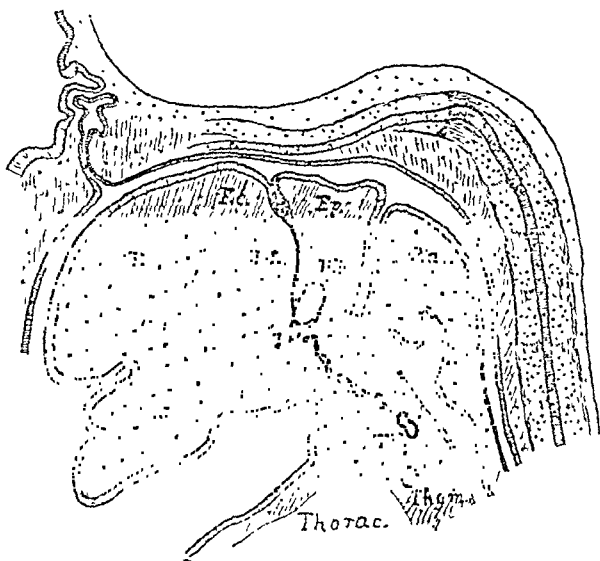
Photograph of section—low power—showing relation of glandular tissue to capsule.
a. Capsule. b. Delicate thyroid tissue partly bruised.

"The bulk of the growth was found, upon microscopic examination, to be made up of closed cavities, varying in size from 0.07 to 0.40 mm. in diameter. The walls of these were clothed with a low cylindrical epithelium, which in the smaller spaces seemed nearly to fill the opening, while in the larger it formed simply a lining, the rest of the space being occupied by a homogeneous substance, staining deeply the picric acid or eosin. The formation of this material by the transformation of the cells could be readily seen in the smaller cysts (Fig. 2). The walls separating the cavities were of a fibrous structure, with relatively few nuclei, varying in width from a mere line to a band of some width. This was directly continuous with wider bands, which divided the growth into irregular, ill-defined lobules, and was spread out upon the surface as a sort of capsule (Fig. 3). In places, vessels were very abundant.

"The structure is that of a ductless gland, with colloid degeneration, and in all its essential histological details corresponds to the thyroid.

"From an embryological point of view a thyroid inclusion is perfectly possible at the place from which this tumor was removed. For, according to the latest investigations,¹ the middle lobe of the thyroid is developed in a track which is directly continuous with the foramen cæcum

FIG. 4.



Thyreoglossal track, after His.

T. Tongue. U.J. Under jaw. Thorac. Thoracic cavity. Ep. Epiglottis. H.B. Hyoid bone. F.c. Foramen cæcum. T.L. Tractus lingualis. Th. Th. Thyroid gland. Thym. Thymus gland. P.a. Arytenoid fold.

of the base of the tongue. And this track is still frequently marked in the adult by the so-called processus pyramidalis, a continuation of the middle lobe to the hyoid bone, and more rarely by the accessory thyroid glands described by Zuckerkandl and Kadyi as glandulæ supra and

¹ His: Der Tractus thyreoglossus und seine Beziehungen zum Zungenbein, Arch. f. Anat. u. Physiol., anatom. Abtheil, 1881, S. 26.

epihyoidea. 'From there it is but a short step to the foramen cæcum and the site of this growth. So, from a consideration of the structure and of the development, there is little doubt that the real nature of this exceedingly rare tumor must be that of the thyroid gland.'

A search through literature shows that tumors in this region are rarely observed. Mr. Henry T. Butlin reports, in 1890, two cases of a similar nature.¹

The first occurred in a female thirty-two years of age, and was thought to be about the size of a hen's egg. Tracheotomy was performed, and the tumor was removed through the mouth by an incision on the median line and scooping out the soft mass. There was a recurrence, but the tumor remained much smaller in size. The second case was also a female, twenty-three years of age. The tumor, which had existed two years, and was smaller than the former, was removed by the galvanocautery loop.

Butlin has succeeded in collecting eight cases, including the two above mentioned. They were all females, and the ages varied from infancy to thirty-two years. One case is reported as existing near the tip of the tongue, and it seems doubtful, therefore, whether it could be placed in the same category. In one case the tumor was very large and caused the death of the infant a few hours after its birth. In the case reported by Bernays, of St. Louis, there was a decided swelling in the middle line of the neck beneath the root of the tongue, and the bulk of the tumor appears to have been in the substance of the organ. Both Bernays and Sutton have regarded these tumors as accessory thyroid glands. Butlin agrees with this view, although formerly he considered them simple adenomata. Mr. Bowlby is, however, of the opinion that these tumors are derived from the follicular glands at the back of the tongue.

I have myself twice seen tumors at the dorsum of the tongue which were probably of this nature. One was a small tumor removed from the dorsum of the tongue by one of the surgeons of the Massachusetts General Hospital some twenty years since. It was given to me for microscopical examination, and consisted of tissue resembling closely that of the thyroid gland. The second case was seen by me in May, 1888, in consultation with Dr. Knight:

The patient, Miss T., was about twenty-one years of age, and the tumor, according to Dr. Knight's report, was "about the size of the last phalanx of my ring finger." It gave her but little trouble; no operation was advised, and the patient has since been lost sight of.

Wölfler, in his *Monograph on Goitre*, which has recently appeared, mentions the case reported by Wolf (one of those included in Butlin's series) as the only one to be found in the literature of the subject.

It is well to remember that accessory thyroid glands, both lateral and

¹ Clinical Society's Transactions, vol. xxiii., p. 118.

median, may develop into tumors. Among these may be included mucous cysts situated near the hyoid bone or stretching in tubular form from the foramen cæcum to the hyoid bone. Some of the retro-sternal types of goitre owe their origin to those accessory glands which are situated close to the aorta. Tumors below the angle of the jaw or beneath the sterno-mastoid muscle, as well as the retro-pharyngeal, intra-laryngeal, and intra-tracheal tumors, owe their origin to lateral accessory thyroid glands. (Wölfler.)

The ease with which the base of the tongue was brought out of the mouth in this case is worth noting. This was due probably to the relaxation of the parts caused by the presence of a tumor of this size; but in part also to the ligatures passed through the base of the tongue. The posterior pillars of the fauces were made tense by this manœuvre. By dividing them the tongue could have been brought still further forward had it been necessary.

THE GASTRIC DISORDERS OF PHTHISIS.

WITH SPECIAL REFERENCE TO THE CAUSES, PATHOLOGY, AND
TREATMENT OF THE SYMPTOM OF VOMITING.

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THE DYSPEPSIA AND VOMITING OF PHTHISIS.

It has been said that every disease or every dyscrasia has its own form of dyspepsia.

This is true to a limited extent only in phthisis. There is a strong tendency to dyspepsia and gastric disorders, both in persons of a tubercular diathesis and in all stages of the lung affection. So much so, that some authors have spoken of "dyspeptic"¹ or "gastric phthisis"² as a special form of the disease, or of "scrofulous dyspepsia"³ as a group of symptoms peculiar to tubercular subjects. While it has long been recognized that persons of a delicate constitution are extremely liable to atonic dyspepsia or to gastric catarrh, the features of these complaints do not differ essentially from those occurring under other conditions. If there is a difference, it is to be found in the liability to recur and the intractability of the dyspepsia to drug treatment, apart from favoring hygienic and climatic influences. In other words, an atonic dyspepsia

¹ Brinton : Diseases of the Stomach.

² Wilson Philip : Med. Chir.-Trans., vol. vii., 1816.

³ Mentioned by Wilson Fox : Treatise on Diseases of the Lung and Pleura.

in such a patient will readily yield to the effects of a pure and bracing air and residence on a dry soil, when treatment by drugs alone is futile ; whereas, in another subject in whom the primary cause of the atonia is a removable one, or has ceased, the symptoms will subside when tonic treatment is adopted.

When, however, there is disease of the lung, there are more definite causes by which to explain the tendency to dyspeptic symptoms. I do not know of any description of these conditions more lucid than that of the late Dr. Budd.¹ The sympathy between the lungs and stomach may be ascribed (as he has stated) to a reflex nervous influence by which an undue secretion of gastric juice is excited ; and the functional disorders of digestion which depend upon this may, in their turn, lead to catarrhal and inflammatory states of the mucous membrane. In the later stages of the disease the obstruction to the flow of blood through the lungs will (he affirms) keep the stomach in a constant state of passive congestion. A small exciting cause will then, as in the previous case, set up inflammatory action and symptoms of greater severity.

A further question enters into the subject of the connection of dyspepsia with phthisis. The want of assimilation of fat has been adduced by some as one of the causes of the development of tubercle. Hughes Bennet,² who is the originator of these views, lays stress on the fact that in phthisis "an excess of acidity exists in the alimentary canal," and that, hence, by the neutralization of the pancreatic juice, fats and carbohydrate food are imperfectly prepared for secondary digestion and assimilation. This, however, presupposes a dyspeptic origin for all cases of phthisis, or, if that be not so, there is a fallacy in the argument which gives a primary place to imperfect fatty metabolism in the causation of phthisis, and yet attributes it to a condition of digestion itself dependent on phthisis. While everyone must admit the value and indeed the truth of the observations of Hughes Bennet,³ it is difficult to regard his theory as a satisfactory explanation of the pathology of tubercle.

Wilson Fox regards the connection between phthisis and the perverted metabolism of fat as an indirect one in the incipient stages of the disease, and others regard the distaste for fat, which occurs so frequently in phthisis, as entirely secondary to disorders of digestion.

One common symptom of the gastric disorders of tubercular disease demands special treatment, and I propose to deal with it at some length in the present paper. *Vomiting* occurs in so large a proportion of the cases that it might almost be described as a characteristic of the dyspepsia of phthisis, were it not that in many instances it has no dependence

¹ Budd : On the Stomach, 1855, pp. 53, 186.

² Hughes Bennet : Pulmonary Consumption, 1859.

³ Ibid.

upon any affection of the gastric mucous membrane, but is referable to other and reflex causes.

The "vomiting" of phthisis is an accessory symptom of great importance. While in cancerous disease it is a well-known fact that the lower the vitality of the patient the less active is the progress of the morbid growth, the reverse holds good in phthisis. Any cause which tends to a loss of nutrition and to general exhaustion invariably hastens the tubercular process. Digestive disorders are among the most frequent of such causes, and hence the importance both of diagnosing the malady with which they are associated and of combating them with all the means in our power.

In the early literature of phthisis but few authors mention the prevalence of gastric symptoms. Thomas Young, in his work on *Phthisis*, published in 1815, collects the opinions of all the early writers upon the subject. Of these, Aretæus remarks that "in some consumptions there is no expectoration at all, but the patient feels a weight in the chest, with nausea and chills in the evening." Again, Morton, in his *Phthisiologia*, in 1619, notices the characteristic connection between cough and vomiting in early phthisis. In the early part of the present century, Bayle, in 1815, attributes vomiting to the cough or to a sympathetic irritation of the stomach. It is, however, to Louis and Andral, a few years later, that we are indebted for a more complete account of the gastric disorders of phthisis. While admitting that in some cases vomiting might be the result of the cough, the tendency of these authors was to attribute almost all the cases of loss of appetite, nausea, and vomiting, occurring in phthisical patients, to a gastric lesion, and on the other hand, to attach too much importance to the post-mortem appearances of the stomach.

No recent author has devoted so much attention as have those named above to the gastric derangements, although they are briefly referred to in every work on phthisis. Moreover, the only published and succinct accounts of the causes upon which vomiting depends in this disease I find in several papers by French authors of the last fifteen years.

Vomiting may occur at any period during the course of pulmonary phthisis. In the early stages the prominence and severity of the symptoms may completely mask the real disease, and in fact may lead to an error of diagnosis, unless a methodical and careful examination of the lungs has been made. It is these cases which Latham¹ has emphasized when he remarks that those who do not understand the case comfort their patient with the assurance that their disease is "all stomach," and "that it is within the reach of an easy cure."

It is an interesting fact that Lannec, whose work upon *Auscultation of*

¹ Sydenham Soc. Latham's Clin. Med., vol. ii., sect. xii., p. 15.

the Chest has produced so great a revolution in the accuracy of diagnosis, did not in his own person reap the benefit of his discoveries. He died of tubercular disease of the lung in 1826, but his malady was only recognized a few months before his death, and was then in an advanced stage. According to his son's account his health broke down in 1818 (eight years previously), soon after the completion of his great work. He suffered then from "dyspepsia and anorexia but without redness of the tongue, nausea, vomiting, and diarrhoea with great muscular debility." He recovered in some measure until the failure of his health, about six months before his death.

It is difficult to believe that his disease would not have been recognized earlier had the same accuracy of examination that he himself inculcated been practised by the other physicians of his day.

This class of cases, in which the symptom ushers in the disease, I shall describe under the head of "peripheral or sympathetic vomiting." They must not be confounded with the condition of debility associated with anæmia and vomiting which sometimes precede the active manifestation of tubercular disease. Such a condition, and in fact any which lowers the vital functions, favors the deposit of tubercle and encourages its activity. At the same time it is not always possible to determine whether the anæmia and debility are not the manifestation of a latent tuberculosis rather than the predisposing cause. This applies especially to out-patient practice in the hospitals; for, if the patient is under careful clinical observation, the presence of an elevated evening temperature will be an important guide to diagnosis, and should raise the suspicion of disease of the lungs, even though the physical signs may not by themselves be sufficient to warrant it.

Another source of peripheral irritation is to be found in the mucous membrane of the pharynx and larynx. This may occur at any period of the disease. In an important class of cases there seems to be good evidence that there is interference with the trunk of the pneumogastric nerve by the pressure of enlarged bronchial glands. This view is insisted on by many French writers on the subject, to whose views I shall have occasion to refer. In other patients it is the violence of the cough that leads to the rejection of the contents of the stomach. This has been known by the name of mechanical vomiting. At all stages of phthisis the stomach itself may be affected. This vomiting from gastric disease may be produced by any degree of irritation, from simple catarrh to acute and chronic inflammation, and more rarely ulceration; while frequently at the close, its muscular and mucous coats become atrophied and softened, so that the function of digestion is greatly impaired. From any one of these causes the fatal persistence and obstinacy of the symptom may hasten the termination. Lastly, the occurrence of vomiting in the young may sometimes depend upon central irritation and

precede a set of symptoms which are dependent upon the formation of miliary tubercles in the membranes of the brain. A phthisical patient is not free from other coincident affections capable of causing vomiting which are not themselves part of the tubercular malady. He may be an alcoholic subject and be affected with cirrhosis of the liver, or he may suffer from simple ulcer, or from cancerous disease of the stomach. I do not propose to enter into detail with regard to these cases, but it is important to remember that two different diseases may coincide in the same subject. On the other hand, certain sequelæ of phthisis may be present, such as amyloid disease of the kidneys, or of the vessels of the stomach, or fatty degeneration of the liver, and the disorders of digestion to which these predispose may be a further source of aggravated vomiting.

The subject of vomiting is a most complex one, and, to enable me to tabulate the various causes and conditions under which it occurs in tubercular disease, I shall briefly describe its physiology and the means by which the act can be produced.

Vomiting consists in the forcible expulsion of the contents of the stomach through the œsophagus and mouth.¹

It is a reflex and spasmodic movement, consisting of two main factors: (1) The contraction of certain muscles by which the stomach is forcibly compressed. (2) The active relaxation of the cardiac orifice of the stomach, or end of the œsophagus.

The diaphragm is depressed by a deep inspiration, and with a closed glottis the sudden expiratory movement which precedes the act of vomiting causes the whole force of contraction of the abdominal muscles to be exerted upon the stomach. A second factor, however, is necessary. Majendie,² by his classical experiment, established the fact that the stomach plays an entirely secondary part in the act. It facilitates expulsion of its contents by its own peristaltic movements, but vomiting can be produced, as he has shown, when a bladder or bag is substituted for it—not, however, according to Schiff,³ unless the cardiac orifice with its dilating-mechanism be left intact.

While the expiratory effort is being made, the longitudinal fibres of the œsophagus contract, as well as the muscular fibres radiating from the cardiac end of the œsophagus over the stomach, and the diaphragm remaining fixed, their contraction, instead of pulling down the œsophagus, as it would if they had not a fixed point upon which to act, aids in dilating the orifice.

Both of these two factors then are essential before the contents of the stomach can be rejected.

¹ Lauder Brunton: Pract., 1874.

² Majendie: Mémoire sur le Vomissement.

³ Dr. Michael Foster: Physiology, 3d ed., p. 274.

When the abdominal muscles and diaphragm contract without the œsophageal muscle, retching is the result, and the contents of the stomach are unable to pass the contracted cardiac orifice; otherwise vomiting would be the result of every violent fit of coughing, and we know that in diseases other than phthisis, in which cough is a prominent symptom, vomiting rarely occurs. I would even go so far as to assert that when the history of the patient reveals frequent vomiting with the cough, I have been led to regard it as strong presumptive evidence of the existence of phthisis (with the single exception of whooping-cough).

For the coördination of the movements of these various muscles nervous influence is essential. The centre from which the impulses proceed is evidently in close connection with the respiratory centre in the medulla. Efferent impulses must descend by the various respiratory nerves to cause the contraction of the muscles of respiration. But the nerve controlling the dilatation of the œsophageal sphincter is the vagus, and this is the nerve by which efferent impulses descend from the centre; and it is probable to a greater extent by the left vagus than the right. The act of vomiting may be produced by impulses starting from the centre in the medulla, by direct irritation of the centre itself, by disease in its neighborhood, or by the condition of the blood.

Further, the effect on the centre may be produced in a reflex manner by impulses reaching it by a variety of afferent paths. Those with which we are concerned in the present subject are mainly branches of the vagus (and it will be remembered that the nerve contains both afferent and efferent fibres).

a. Branches of the vagus:

Gastric branches—irritation, inflammation, or ulceration of the stomach.

Pulmonary branches.

Laryngeal branches.

b. Pressure on any part of the trunk of the vagus.

c. Pharyngeal branches of the glosso-pharyngeal nerve.

I shall describe the forms of vomiting in phthisical patients under the following heads:

I. Peripheral or sympathetic vomiting.

a. Irritation of the peripheral terminations of the pulmonary branches of the vagus.

b. Irritation of the pharyngeal and laryngeal mucous membrane, including the epiglottis.

c. Interference with the trunk of the vagus by enlarged bronchial glands (adenopathie tracheo-bronchique.)

II. Vomiting due to the violence of cough (so-called mechanical vomiting).

III. Gastric vomiting proper. (Irritation of gastric branches of the vagus.)

IV. Central irritation. (Tubercular meningitis.)

I. SYMPATHETIC OR PERIPHERAL VOMITING.

A. *Irritation of pulmonary branches of the pneumogastric.* This occurs in some cases at the commencement of pulmonary phthisis, at a period when the diagnosis is not easily made, and depends upon a careful examination of the lungs. Of this Fagge remarks: "I have known instances in which medical men have been led by it into the grave error of supposing that the patient's complaints were all due to the disorder of the stomach." In these cases vomiting is not only a conspicuous, but the main symptom. Food is rejected almost as soon as it is taken, but there is no pain or even tenderness at the epigastrium. The appetite is unimpaired, usually, and the tongue is clean or thinly furred. When the stomach is empty there is no inconvenience felt. There is sometimes anæmia, but by no means to a marked degree, and when present it can be traced to the inability to retain nourishment.

The patient's own account is misleading. He is so absorbed with this prominent symptom of his complaint that the cough is often ignored or unnoticed. Still, persistent inquiry will elicit the fact that there has been a dry cough for perhaps some weeks or even months.

In some cases the vomiting is preceded by a sense of suffocation and by slight cough, but not by a violent fit of coughing. The presence of food in the stomach appears to produce a reflex effect at other terminations of the vagus.

This form of vomiting is said¹ to occur more frequently in women than in men; but in the cases that I have collected, up to 1888,² I find that, out of a total of thirty-seven derived from three hundred and sixty cases of phthisis in both sexes, twenty-one cases of sympathetic vomiting were present in men, as compared with sixteen in females.

The physical signs are usually confined to one or both apices, and are often so slight as to escape notice. Rough or coarse breathing, with increased expiration and a slight increase of vocal resonance, or, more important still, a feeble or interrupted respiratory murmur, may be all that is detected. Before long, however, the disease in the lungs develops. A few moist râles appear, at first only after cough, but later accompanying both the inspiratory and expiratory murmur; while the breath-sounds become tubular and bronchial, voice resonance and vibrations are increased and impairment of percussion resonance becomes manifest.

¹ Wilson Fox: *Treatise on Diseases of the Lungs and Pleura*, 1891, edited by Dr. Coupland, p. 821.

² St. Bartholomew's Hospital Reports, vol. xxiv., p. 139.

The above signs may be rapid in their development, covering the space of a few weeks at most.

With the increase of physical signs cough and expectoration appear or increase, while it is a striking fact that the troublesome vomiting will subside and finally disappear. The cause of vomiting in this class of cases is to some extent obscure. It cannot be attributed to the cough, for this is often scarcely noticeable and only becomes prominent with the cessation of vomiting. There is no evidence of gastric catarrh, for the clean tongue, the natural appetite, and the complete absence of pain or epigastric tenderness would preclude this. Further, the absence of any marked degree of anæmia or of more than a slight constitutional disturbance (a moderate elevation of temperature of no more than a degree or two at night) leads us to seek a further cause for the symptom.

An explanation that seems plausible and that has often been adduced is that the early deposit of tubercle irritates the peripheral terminations of the branches of the vagus in the lungs and produces a reflex effect upon its gastric branches through the centre in the medulla. With the softening of the tubercles, as evidenced by the development of moist sounds and other signs in the lungs, the pressure upon and irritation of the vagus terminal fibres is relieved and vomiting ceases.

David Craigie, in 1840, notes this disappearance of vomiting in the early stage of phthisis. He attributes the symptom, however, to the rigors and fever which, he says, are present. He adds: "The appetite, nevertheless, is not much impaired, and the patient often takes food with much eagerness and enjoyment. The tendency to vomit vibrates and finally ceases as the progress of the distemper advances from the inflammatory to the softening stage."¹

The presence of rigors or fever, except in acute tuberculosis, is not a usual experience at an early period of the disease. I cannot say that I have ever observed more than a slight evening rise of temperature such as I have mentioned.

I have referred to the views of Budd,² in 1855, upon sympathetic irritation of the stomach, and he applies these to the vomiting as well as to the dyspeptic symptoms of phthisis.

In his Lumleian lectures for 1876,³ my father mentions this cause of vomiting. "The irritation of the pulmonary branches of the pneumogastric," he says, "is a common cause of disturbance of the stomach, and constant vomiting is the result." He adds that "it will often be found that when the disease in the chest has advanced the vomiting suddenly ceases, but only to reveal disease of the lung which has made

¹ David Craigie: *Practice of Physic*, 1840, vol. ii. p. 996.

² Budd: *Loc. cit.*

³ Habershon: *On the Pathology of the Pneumogastric Nerve*, 1876.

insidious progress during the time when treatment of the thoracic disease might have been most efficacious."

The prognosis of such cases is, as far as my experience goes, invariably bad. I have seen several in the course of six years' out-patient practice at the Royal Chest Hospital, and in no single case has the patient lived more than a year (and some for no longer than six months) after the first manifestation of physical signs in the lungs. I am led, therefore, to take a gloomy view of this form of sympathetic vomiting, on the ground that the symptom is probably an evidence of the rapidity of spread of tubercular centres of deposit and an index of an acute irritation.

B. *Irritation of the pharyngeal and laryngeal mucous membrane.* The vomiting centre in the medulla may be thrown into action by irritation proceeding from the fauces, soft palate, and pharynx, or from the mucous membrane of the epiglottis and ary-epiglottidean folds. This action is purely reflex, and can be produced physiologically, as when any of the above parts are irritated by touching them with a feather. The afferent nerves, whose peripheral endings are stimulated, are either glosso-pharyngeal or the pneumogastric branches of the tenth pair.

Vomiting is even more likely to occur when the mucous membrane is in an irritable or hypersensitive condition. In phthisical patients the throat and larynx are extremely liable to suffer, and the sensibility may be exalted by a variety of conditions, the simplest and indeed the most common of which is ordinary acute or chronic catarrh. Frequently the inflammatory state does not extend above the level of the epiglottis and its folds, while these are seen by the laryngoscope to be red and their vessels injected. In other cases there is chronic catarrh of the pharynx, with a long, pendulous, and relaxed uvula, which leads to an irritable cough, especially when the patient lies down. Granular pharyngitis is a common condition, and it may be observed in every stage, from the simplest to that of extreme hypertrophy of the mouths of the mucous follicles. Laryngeal catarrh frequently precedes, and probably predisposes, to the more grave affection of the larynx known as tubercular laryngitis, due to the infiltration of certain parts by a deposit of tubercle.

Perhaps the commonest appearance is one which is often regarded as pathognomonic of the affection—a pale pyriform swelling of one or both arytenoid cartilages with thickening of the ary-epiglottidean fold. But it is in the later stages of the affection that symptoms are produced and become prominent, though the voice is early affected. This is the stage of ulceration. Ulcers occur in the inter-arytenoid region and at the posterior part of the vocal cord, or on some part of the ary-epiglottidean folds, commonly also on the posterior surface of the larynx. According to Mackenzie, the ulcers on the cords are generally bilateral.

The disease may extend in an upward or downward direction. In an advanced stage the epiglottis is often œdematous and ulcerated. In some cases ulceration is most extensive, and leads to the passage of food into the trachea.

Downward, the ulceration may spread to the parts beneath the vocal cords, leading to perichondritis of the cartilaginous structures and ulceration of the trachea.

Sometimes tubercular ulcers are seen on the fauces, soft palate, or the back of the pharynx, and are accompanied with great soreness of the throat and painful deglutition.

Small, shallow, non-tubercular ulcers (superficial erosions) also occur in phthisical patients on the pharynx, or in the larynx or trachea.

In the catarrhal affections of phthisical patients the symptoms produced are those of ordinary catarrh. Sore-throat and irritability followed by cough, and sometimes retching or even vomiting with the cough; hoarseness or aphonia and hyperæsthesia of the mucous membrane of the pharynx. If the catarrh is antecedent to the tubercular laryngitis it is succeeded by more severe symptoms, which become still more pronounced in the later and ulcerative stages of the laryngeal affection.

Deglutition now becomes painful, and the act of swallowing, or indeed any movement, may, in bad cases, be dreaded by the patient. This is specially the case when the epiglottis is ulcerated, or where there is perichondritis of the laryngeal cartilages, or where the posterior parts of the arytenoids bordering on the œsophagus are ulcerated.

Vomiting in such patients, as well as in those who suffer from catarrh or ulceration of the pharynx or throat, is very easily produced. It frequently occurs after a fit of coughing, but in some cases it is caused by the act of swallowing, and is not necessarily accompanied by cough.

c. *Tracheo-bronchial adenopathy.* By this term is meant the enlargement of certain of the mediastinal glands at the root of the lung and in the neighborhood of the large bronchi, which, by their compression of the pneumogastric trunk, produce certain symptoms. Though not strictly a peripheral affection, it is convenient to include the cases of vomiting, presumably due to this cause, in the present group; for the symptoms produced may fairly be described as sympathetic.

My description of the affection is mainly gathered from the writings of certain French authors—Dr. Guéneau de Mussy and his pupils, MM. Baréty, Varda, Simoneau, and others. In a paper in the *St. Bartholomew's Hospital Reports* I have quoted some of the literature of the subject, and it is not, therefore, necessary to repeat this. Suffice it to say, that several cases have been recorded in the earlier part of the century in which the observers have attributed certain symptoms to

pressure upon the pneumogastric nerve; and in others, in which the diagnosis has been made, the nerve has been found, after death, tightly compressed (and, in more than one case, disorganized) by enlarged glands. The main symptoms thus recorded comprise attacks of vomiting and dyspnœa, with a peculiar cough, something like whooping-cough.

No doubt exists that the glands in phthisis, and especially the mediastinal glands, are very frequently enlarged and caseous—that is, infiltrated with tubercle; and the importance of these scrofulous or tubercular glands was early appreciated by many writers on phthisis, notably in children, but also in adults. Guéneau de Mussy's interesting account in the *Clinique Médicale* for 1884, vol. iii., and the numerous examples of the disease that he has collected, would seem to leave no doubt that in some cases the enlarged glands produce very definite symptoms by pressure. In England his views¹ have not been altogether accepted, partly because he attributes the symptoms of whooping-cough to the same cause (pressure on the vagus), and some of the best of our English authorities have differed from him in his explanation of the pathology of that affection.

Among the symptoms which are attributed to compression of the pneumogastric are:

1. Pain referred to the situation of the manubrium sterni, or to the first two costal cartilages and the neighboring interspaces on either side, or to the position of the fourth or fifth dorsal vertebræ behind. The pneumogastric nerves in the neck have also been sensitive to pressure.

2. A spasmodic and frequently a laryngeal cough, in many cases of the nature of whooping-cough (*Toux coquelucoïde*), and more rarely aphonia.

3. Vomiting, and occasionally dyspepsia with gastralgia.

4. Congestion of the base of the lung on the corresponding side.

Physical signs, if any are present, are more easy to detect in children, but they are described by De Mussy in several cases in the adult.

If the lung on the affected side is not universally infiltrated with tubercle, impaired resonance may be detected in the mediastinal region in the situations described as the occasional seat of pain. The respiration is altered, but the alteration depends rather upon the consolidation of the lung, or upon the compression of the bronchus in the neighborhood of the enlarged glands. Weak breathing is said to be commonly present.

The symptoms upon which stress is laid as a means of diagnosing the affection are: repeated vomiting accompanied with a cough of peculiar nature.

¹ See Brit. Med. Journal, Jan. and Dec., 1879.

De Mussy takes the view that an affection of the left side is far more frequently associated with vomiting than when the right pneumogastric is irritated, and that the vomiting appears more obstinate. He bases his opinion on his own independent observations, though he quotes others who have noticed it. In a number of cases collected by Simmoneau,¹ in which vomiting was believed to be due to compression of the pneumogastric, ten out of thirteen occurred on the left side. This coincidence has been attributed to the anatomical distribution of the branches of the vagus nerve and to the results of physiological experiments on the functions of the two nerves.²

It is not only in the disease described by De Mussy that the symptom of vomiting occurs more frequently when the left lung is affected. In my paper, published in the *St. Bartholomew's Hospital Reports* for 1888, I have endeavored to inquire into the truth of a floating opinion which I had frequently heard expressed that left apex phthisis is more often associated with vomiting than the right apex disease. I have examined the statistics of some 360 cases under my care, and find that generally the symptom occurs in 67.3 per cent. of left apex cases as compared with 27.8 per cent. of the right apex.

This, however, includes all cases of vomiting from whatever cause, and it is evident that some causes common to all, such as laryngeal irritability or a gastric catarrh, may produce the symptom, irrespective of the particular side affected by the tubercular disease. When the cases of sympathetic vomiting alone are considered, the figures are even more striking. Of thirty-four cases, the left lung is affected in thirty, and the right lung in four; in other words, about 88 per cent. are left apex cases and 12 per cent. right apex. The point is not an important one, nor are the statistics sufficiently large to establish a rule; but the result appears to be more than accidental, and may fairly be attributed to the anatomical distribution of the branches of the left vagus nerve.

II. MECHANICAL VOMITING, OR VOMITING DUE TO THE VIOLENCE OF COUGH.

Vomiting with cough has been recognized by most writers upon the disease as a frequent accompaniment of phthisis.

In 1619 Morton³ considers that "cough, with a disposition to vomit, while the appetite remains good, is almost a characteristic of early phthisis." Bayle⁴ in 1815 remarks that vomitings are frequent in

¹ Simmoneau: Thèse de Paris, No. 115. Des Vomissements chez les Phthisiques, 1881.

² Claude Bernard: Physiologie de Système-Nerveux.

³ Morton: Phthisiologia, London, 1619.

⁴ Bayle: "Recherches sur le Phthisie Pulmonaire," translated by William Barrow, 1815.

phthisical persons, and often arise from severe fits of coughing. Louis¹ (in 1825) believes that cough alone can provoke vomiting, but seldom, however, and then usually at the commencement of the malady. In these cases there is no epigastric pain, the appetite is good and digestion easy. Sir James Clark,² in his work on consumption, in 1835 says: "It becomes a matter of some moment, in a practical point of view, to distinguish the vomiting which occurs in the course of consumption (and which is commonly attributed to the cough) from that which depends on a morbid state of the stomach. When the vomiting is simply the result of the cough we find no epigastric tenderness or pain, the appetite remains, and the digestion in the intervals of coughing goes on well. It frequently occurs at the commencement of the disease."

Other authorities differ greatly in their views as to the influence of the cough upon vomiting.

Andral³ refers almost all cases of vomiting provoked by cough to a morbid condition of the mucous membrane of the stomach; while others have shown that such a pathological state may exist without symptoms. On the other hand, some believe that vomiting is always preceded by cough, and often caused by the cough,⁴ while others deny that cough alone is able to produce the symptom.

It is recognized, however, at the present time, that when all reflex sources of irritation are eliminated, some of which I have already considered, there still remains a large class of cases in which the cough appears to be the chief factor concerned in the production of the act. To these cases the term "mechanical vomiting" has been applied. By the word "mechanical" is implied the compression to which the stomach is subjected by the contraction of the abdominal muscles in the act of coughing. In other diseases the term is applied to vomiting due to an obstruction of some part of the alimentary canal. Typical mechanical vomiting is to be seen in a case of pyloric disease. In the present connection, however, the expression is used in a different sense, and perhaps not with strict accuracy.

We have seen that besides the contraction of the respiratory muscles, a second factor is necessary before the reflex act of vomiting is produced, and that this factor is the dilatation of the so-called cardiac sphincter of the stomach. Also, that in many other diseases of the respiratory system accompanied by cough, retching is often the only result of the cough, however violent. In other words, the abdominal muscles compress the stomach, but its orifice remains contracted and the contents

¹ Louis: *Recherches sur le Phthisie*, 1825.

² Clark: *On Consumption*, 1835.

³ Andral: *Clinique Médicale*, 1836.

⁴ Guéneau de Mussy: *Clinique Médicale*, 1884, vol. iii.

are not expelled. Now, it is obvious that for the relaxation of this œsophageal orifice of the stomach one of two conditions is necessary. Either an active dilatation, which is reflex in nature and depends on the pneumogastric influence, or a passive and paralytic condition of the lower end of the œsophagus, by which the muscular tone is lost and the orifice permanently unclosed.

Now, excluding all evident sources of irritation, we have still to consider how cough alone may, in phthisical patients, result in vomiting more frequently than in bronchitis or other respiratory diseases.

Cough may be produced in various ways in the course of phthisis. It may be dry and out of all proportion to the amount of secretion. In this case it is generally due to an irritable condition of the terminal fibres of the expiratory nerves in the lungs and bronchial tubes. On the other hand, it may be, and commonly is, the effort to expel what is practically a foreign body—beneficial, and not harassing, if the expectoration is loose and fluid, but violent in the extreme if the expectoration is viscid and tenacious.

Lastly, the cough may be what has been called a stomach cough, or, as Morgagni first showed, produced by irritation independent of the lungs (for example, even when the membrane of the tympanum is touched). In such cases the mere presence of food in the stomach may produce cough.

Clinically, mechanical vomiting will be found to occur in three different classes of cases. In a large number the violent cough occurs in the early morning on waking from sleep, or soon after rising, and at bedtime. In these the cough has usually been the effect of the difficulty in expelling the secretion, which the patient will describe as thick and often of unpleasant taste. In these patients there is often a degree of irritability or sensitiveness of fauces and pharynx, with or without inflammatory trouble, which is quite sufficient to explain how the reflex factor is supplied.

In a second class of cases, the vomiting occurs chiefly after meals. As soon as food is taken into the stomach, or, at most, half an hour to an hour afterward, cough is provoked, and vomiting speedily follows. There is no doubt of the absence of any gastric cause except what may be broadly defined as irritability, for there is often no pain or flatulence, no tenderness in the epigastrium, the tongue is clean and the appetite unimpaired.

Dr. Douglas Powell has described the mechanical vomiting as follows: "This distressing symptom is especially characteristic of the more indurative forms and stages of the disease. It is primarily due to the mechanical difficulty in expelling secretion from cavities and bronchial tubes surrounded by dense airless consolidation, and secondly, it is

distinctly to be observed that there is undue irritability of the vagus, giving rise to cough directly food is taken into the stomach."

There is, according to my own experience, a rough distinction between the two classes of cases I have named, though naturally there can be no such thing as an arbitrary division. Many cases of vomiting after food of this kind, in which there appears to be an abnormal irritability of the pneumogastric terminations both in lungs and stomach, occur early in the course of the disease (as M. Ferraud, in the *Union Médicale*, 1883, has stated) while I have seen others in late cases of disease with considerable consolidation and contraction of lung, or with cavitation. On the other hand, the morning and evening vomiting which appears to be associated with a tenacious sputum and a difficulty of expectoration is more often found in the well-marked or advanced disease, and with or without this gastric irritability.

A third class of cases still exists, in which no special irritability of stomach or fauces and pharynx is present. In these cases the vomiting is far more frequent after the evening meal only, or when the patient has been in bed an hour or two. There is some difficulty in explaining the cause on physiological or pathological grounds.

An interesting suggestion is made by Ruehle, in *Ziemssen's Encyclopædia of Medicine*. He remarks that "The nervous centre from whose irritation the reflex action of coughing proceeds is situated very near the center concerned in the act of emesis; the irritation probably passes readily from one to the other, and the more readily when the existence of pharyngeal or laryngeal catarrh keeps the vomiting centre in an irritable condition."

So far, it appears that cough is in a large proportion of the cases supplemented by a state of irritability at one or other of the terminal branches of the vagus.

But in advanced stages of tubercular disease there is not the same difficulty in explaining why food should be speedily ejected when cough occurs. The general loss of nutrition leads to muscular atrophy, and it is a common thing to find the stomach, apart from any more acute morbid condition, in a state of extreme wasting. Not only the mucous membrane but the submucous and muscular coats are attenuated and softened, and toward the close of life digestion is impaired, not only from the atrophy of the secreting gastric glands, but from the imperfect and feeble peristaltic movements. It is easy to conceive that the cardiac orifice of the stomach is then permanently relaxed, and cough will be extremely likely to determine the act of vomiting. It must, however, be remembered that when there is considerable dilatation of the stomach, a sequela which is not unusual, vomiting is sometimes, and indeed frequently, absent.

III. GASTRIC VOMITING.

"Of all the organs the digestive tube, next to the lungs, presents the most common lesions in phthisis." Such was the experience of Andral¹ and Louis,² the two great authorities of the earlier part of this century, who have called attention to the gastric disorders of phthisis.

These authors have described with great completeness the various pathological changes that are to be found in the mucous and other coats of the stomach after death. Out of nearly one hundred autopsies, Louis found the stomach unaffected in seventeen cases, that is, about four-fifths presented a well-marked morbid state. Andral found a similar condition in about three-fifths of his cases.

Louis describes these pathological changes under several heads.

1. White softening of the gastric mucous membrane with diminished thickness of the coats.

2. Inflammation of the mucous membrane of the stomach, its walls thickened, and the mucous surface injected (the redness often confined to the anterior wall) and softened.

3. Red softening of the mucous membrane of the great cul-de-sac, accompanied by a mammillated appearance. (This he considers a more chronic affection than any other).

4. Simple ulceration of the gastric mucous membrane, often superficial, and in some cases with thickening in the intervals between the ulcers.

The symptoms of these lesions were variable, and usually confined to an advanced period of the disease. They were mostly preceded by anorexia, and accompanied by epigastric pains, nausea, and vomiting (sometimes of unaltered food but usually of a bilious character) associated with a red or furred tongue. This group of symptoms was most frequently observed in cases which presented, after death, a thinned and softened or an ulcerated mucous membrane. Of the mammillated condition, he remarks that he has been unable to detect any symptoms by which it could be recognized, and in the cases of red softening he observed distinct symptoms only a few days before death.

In a few cases where the combination of epigastric pain, anorexia, and vomiting occurred, no gastric lesion was found.

Andral³ attributes the gastric disorders in phthisis to an inflammatory condition of the gastric mucous membrane. He narrates most fully the various shades of symptoms which the gastritis produces in the different stages of the disease. In his own words "The functional disturbances, of which the stomach of phthisical patients is the seat, should

¹ Pathological Researches on Phthisis, by Louis (trans. by Cowan), 1835.

² Andral: Clinique Médicale (Spillan trans.), 1836.

³ Loc. cit.

be referred in the great majority of instances to an inflammation, either acute or chronic, of this organ; but there are many cases in which the organic alterations are a result neither of inflammation nor even of any process of irritation or congestion. . . . These consist of extreme attenuation, real atrophy of the parietes of the stomach."

The appearances described by Andral are in many respects similar to those of Louis' cases. The mucous membrane of the stomach presented an inflammatory injection in some cases, more frequently in the great cul-de-sac, and without any change in the subjacent tissues.

In others it was of a brown, slate colored or gray tint, either in patches or universally. Frequently the mucous membrane was softened, sometimes red or pulpy, at others, white and jellylike, the extent of softening varying from that of mere alteration of its natural consistence to a complete exposure of the submucous cellular tissue. More rarely ulceration was found, in some cases with thickening of the tissues, and in a number of cases the parietes of the stomach were atrophied with a thin mucous membrane and a wasted muscular coat.

Dr. Carswell, in his *Pathological Anatomy* in 1838, called attention to the fact that a large number of these appearances, and especially the white softening of Louis, were due to a post-mortem change produced by the action of the gastric juice. According to him, John Hunter first observed this lesion (softening), and described it as "digestion of the walls of the stomach after death, and as the immediate consequence of the solvent property of the healthy gastric juice."

Carswell notes that in France the opinions of Hunter were at first received with doubt, and afterward turned into ridicule, and in consequence the post-mortem effects of the gastric juice were continually described as pathological lesion. The memoir of Louis on "*Ramollissement avec Ascincissement et de la Destruction de la Membrane muqueuse de l'Estomac*" is, he says, a striking example of this kind.

The situation of these changes, according to Carswell, is usually in the most dependent part, viz., the fundus or in any other part which has accidentally acquired a dependent position. The appearances he describes as resulting from post-mortem change are those of softening, erosion, or even perforation. The degree of softening varies from a slight diminution of consistence of the coats of the stomach to their conversion into a gelatinous pulp. In more extreme cases the mucous membrane has disappeared either in patches or over its entire extent, leaving the submucous coat denuded.

Further, when the membrane has been thrown into folds, the softening occurs in the form of bands or stripes of various dimensions described by Louis as a pathological condition.

Alterations in color accompany these changes. An extreme pallor is often observed, which accounts for the "*ramollissement gélatiniform*"

described by Cruveillier. On the other hand, the coloring matter of the blood may be altered by the acidity of the gastric juice producing shades of dull yellow-brown, or even black or ashy-gray.

Such is the description of Carswell, and his views are now generally received, for they have been abundantly confirmed by other observers.

My father¹ has entered very fully into the changes produced by post-mortem digestion, and in addition to his own observations has quoted the views of Wilkinson, King, and Budd, and the more recent researches of Pavy. He finds these changes occurring not only in phthisis, but after other diseases, especially cerebral, and in young children, where the gastric follicles have been irregularly stimulated and pour out an excessive secretion.

Two other facts tend to further diminish the value of Louis and Andral's pathological investigations. The first has reference to the reliance that is to be placed upon a post-mortem condition of vascularity as a sign of a precedent gastric catarrh.

There is no doubt that during life, irritation, catarrh, or an inflammatory condition produce varying degrees of redness of the gastric mucous membrane. This has been established by the observations of Beaumont upon the living subject. When a state of catarrh was produced he observed eruptions or deep-red pimples upon the internal coat of the stomach, and at other times irregular red patches of different sizes, with apthous crusts in some cases.

After death, however, it is generally agreed that the mere presence or absence of vascularity cannot be relied on as a proof of previous inflammation or the reverse. Wilson Fox² has expressed this in his writings. He shows that the hyperæmia of inflammation is very liable to disappear after death, either owing to the action of the gastric juice or to capillary contraction. He points out, however, that if there has been a condition of stasis in the bloodvessels before death, hyperæmia and even extravasation of blood is likely to be produced, which will remain after death, and he brings abundant evidence from various observers to show that such vascularity does not by any means prove a previous state of inflammation.

These appearances in cases where there has been no sign before death of any disorder of digestion are familiar to every pathologist. I have frequently observed them on the post-mortem table. They occur in many cases of lung and heart disease in which there has been a mechanical impediment to the circulation, and they are more often to be seen in the fundus or posterior part of the gastric wall.

¹ Habershon on Diseases of the Abdomen, chap. v., p. 131.

² Wilson Fox: Diseases of Stomach, p. 110.

The second fact is that the mammillated state of the mucous membrane attributed to a previous condition of chronic catarrh can be produced after death in the healthy stomach. According to Wilson Fox these mammillations consist of small irregular prominences somewhat like the granulations upon wounds. The appearance is believed by authorities on the subject (among whom are my father, Drs. Wilson Fox and Handfield Jones) to be caused by a post-mortem contraction of the muscular layer of the stomach, which, when it occurs to a less degree, simply throws the mucous membrane into rugæ or folds.

These various fallacies then have considerably detracted from the value of Louis and Andral's accounts. Still the fact remains that phthisis is one of the most common predisposing causes of morbid conditions of the stomach.

The various gastric affections which are now recognized in phthisical patients, and which are responsible for the symptom of vomiting, are as follows:

1. Acute and chronic catarrh of the stomach.
2. Atrophy of the coats of the stomach.
3. Ulceration of the stomach, non-tubercular or follicular, and rarely tubercular.

1. ACUTE AND CHRONIC CATARRH OF STOMACH.

Acute catarrhal gastritis is liable to occur at the commencement of phthisis. Wilson Fox¹ has shown that it more commonly accompanies acute than chronic diseases, and among twenty-one cases in which it has occurred as an incident in the course of another disease, he has only recorded it twice in tuberculosis of lungs or other organs. A large proportion of the rest were acute disorders. At the same time he adds that the affection is not an uncommon accompaniment of the early stages of phthisis. Andral² describes cases of phthisis marked at their commencement by an attack of acute inflammation of the stomach before the symptoms of the lung disease were recognized. He considers that it was probably the primary cause of the attack of phthisis by the sympathetic irritation which it exercised on the lungs. He further describes cases in which it appeared after tubercles had manifested themselves in the lungs—that is, during the first period of phthisis.

My father³ remarks of this affection of the stomach: "There is a predisposition to this form of disease in strumous subjects, but we must distinguish this affection from a sympathetic irritation of the stomach, produced in the early stage of disease of the lungs." Andral, however,

¹ Wilson Fox: Diseases of Stomach.

² Andral: Clinique Médicale, 1836.

³ Habershon: Diseases of the Abdomen.

considers acute gastritis as a still more frequent complication of the later stages of phthisis, when it is usually followed by an aggravation of the lung disease. In other cases the primary affection appears to retrograde while the gastric inflammation is at its height, and the symptoms to be referred to the two organs appear to alternate in a striking manner.

Chronic gastritis, or chronic catarrh of the stomach, is more common than the acute disorder. Wilson Fox has tabulated the various diseases in the course of which it occurs, with the result that he finds it associated with phthisis with remarkable frequency. In sixteen cases out of thirty-one tubercular disease of the lungs was present, and he attributes these figures to the fact that all diseases which obstruct the venous circulation are liable to induce a chronic catarrhal condition of the stomach.

The *symptoms* of gastritis, acute and chronic, present considerable variety. They are more frequent in the later stages of the malady. I am unable, in the brief space at my disposal, to give a detailed account. In the acute form the attack usually comes on quickly, and is accompanied by considerable constitutional disturbance. The face is pale, the countenance anxious, the temperature usually raised two or three degrees. The urine is loaded with lithates and the bowels constipated. The complaint is of pain and oppression immediately after food is taken. The pain is often severe and continues until it is relieved by vomiting. This usually occurs shortly after the meal. The pain is referred to the epigastrium or to the præcordium, and may extend to the left scapular region, or more rarely to the left supra-clavicular fossa. The pain is associated with epigastric tenderness. The vomit consists of unaltered food, but if incessant it may become bilious in character and mixed with mucus. The appetite is generally lost, and thirst is frequently a prominent symptom. The whole attack may subside in a few days, or the acute stage give place to the symptoms of the more chronic affection.

Chronic gastritis, owing to the prostration and exhaustion to which it leads, has a serious effect in accelerating the disease in the lungs. The patient has a sallow or cachectic appearance. The appetite is poor, and in advanced disease completely lost. There may be little or no pyrexia, and the symptoms of pain and vomiting may be replaced by those of a flatulent dyspepsia. Every gradation may be observed between severe pain varying in position as above described and followed by vomiting, and merely a weight and feeling of distention and suffocation after a meal, accompanied by nausea and flatulence. A bitter or acid pyrosis may also take the place of vomiting. The vomiting is noticed within an hour after the ingestion of food, and consists of altered food or of bile. Mucus, especially in the more chronic forms, may be present in large quantities, and I prefer to consider the excess of secretion of mucus in this as in

chronic gastritis from other causes, not as a distinct form of the disease, but as an evidence of prolonged irritation and engorgement of the gastric as of other mucous membranes. The tongue, which is furred and indented at the edge in the acute stage, becomes more red and irritable looking as the disease advances. The tip and edges are raw, and in late stages the whole organ may be entirely denuded of epithelium.

If it continues for a long period the inflammation of the gastric mucous membrane tends to cause an atonic condition of the gastric walls, which terminates in dilatation or leads to atrophy of the secreting glands of the organ.

The appearances after death I have already alluded to. Cases of acute simple gastritis seldom come to the post-mortem room, and I cannot speak from my own experience of any characteristic sign. I have quoted authorities to show that the presence or absence of vascularity is by no means a safe criterion. More certain signs of acute catarrh are said to be a softening and swelling with some opacity of mucous membrane. The submucous tissue is, according to Wilson Fox,¹ sometimes infiltrated with inflammatory products, and the solitary glands enlarged and prominent, especially in the pyloric region. Follicular ulcers (small cup-shaped depressions) are frequently observed, and superficial erosions of the internal coat.

Chronic catarrh, as observed post-mortem in phthisis, leaves more certain changes. The alteration of color is more marked, the mucous membrane presenting more evidences of hyperæmia than in the acute form. Changes of color are more frequent in the pyloric region, an ash-gray pigmentation Wilson Fox considers to be the most characteristic. He also states that hemorrhages, if due to previous catarrh, are capillary or punctiform. Thickening and induration of the mucous and submucous tissues are sometimes met with, and in some cases an appearance somewhat similar to the mammillation of Louis, which some authorities agree can occasionally be produced by local hypertrophy, around the secreting follicles.

2. ATROPHY OF THE MUCOUS COAT OF THE STOMACH.

At the close of phthisis it is not uncommon to find a condition attributed to an atrophy of the gastric mucosa with its glandular structures. It is associated with profound exhaustion of the patient, complete loss of appetite, and usually with extreme anæmia. Gradual in its onset, in some instances it is preceded by dyspeptic symptoms and increasing distaste for food, the tongue is clean, and there is very little pain on vomiting; in others there is evidence of dilatation of the stomach. Food

¹ Wilson Fox: Diseases of the Stomach.

leads to distention and a feeling of oppression, and finally epigastric pain, while the imperfect digestion results in fermentative changes, with excessive eructation, nausea, and more or less frequent vomiting. The tongue is often red and dry, or even denuded of epithelium. On the other hand, the symptoms of atrophy may follow, and in fact be the final stage of a chronic gastritis, and such cases are to be distinguished in their causation from the above class, which may be considered as instances of a primary mucous atrophy—a true gastric phthisis. Sir Thomas Watson refers to this condition as follows: “When in phthisis these symptoms (nausea and vomiting) last long and are accompanied by pain and tenderness of the epigastrium, they denote almost always a thinned and softened condition of the mucous membrane of the stomach.” Except in phthisis, and as an affection secondary to prolonged gastric inflammation or irritation (as in gastric ulcer), atrophy of the mucosa is a rare affection. Probably, from senile change and from conditions of asthenia, some of the gastric follicles waste and lose their functions, but it is not common to find an atrophy so universal as to destroy life by inanition or practical starvation of the patient. No doubt in phthisis the gastric wall shares in the general loss of nutrition and the emaciation of the patient, whereby a condition of muscular atony is the result, for the stomach is often found to be dilated and all its coats attenuated. An important part in the causation of atrophy is, however, to be found in the perversion of nutrition of the individual cells. A condition of fatty change induced by the imperfect process of oxidation in the blood and tissues is frequently seen, the secreting cells being found to be disorganized and loaded with fatty granules and secretion reduced to a minimum.

The mucous membrane of an atrophied stomach presents none of the appearances of inflammation. The internal surface is pale, and the membrane reduced to a thin pellicle. The muscular and submucous coats are often thinned, while the muscular fibres are pale and the striation for the most part absent.

A full description of the microscopic changes will be found in the writings of Handfield Jones, Fenwick, Wilson Fox, and my father, and more recently in the papers of Professor Ewald, in the Sydenham Society's volumes, 1892.

In some of the cases the gastric or dyspeptic glands are so disorganized that their structure is lost, and only a few cellular and nuclear elements are to be seen; in others the glands are devoid of secreting epithelium and cysts may be developed. While in the form of atrophy secondary to gastritis, the destruction of the mucosa is often very great, and the underlying muscular and submucous coats are thickened by fibroid change.

3. ULCERATION OF THE STOMACH—TUBERCULAR AND NON-TUBERCULAR.

Those authors who maintain the virulent and infective character of the tubercular sputum have attempted to show that tubercular ulcers can be produced by direct inoculation, and that this is the cause of the numerous tubercular ulcerations in the small intestine and colon of phthisical patients.

Klebs (Anat. Path., 1876) has affirmed this, and Parrot has asserted that he produced tubercle in the intestines of animals by making them swallow tubercular sputum. It is a remarkable fact, and mitigates seriously against their views, that tubercle of the stomach is an exceedingly rare affection.

Andral only found it in two cases. Barthez and Rilliet, in their statistics in children, found this lesion in twenty-one cases out of one hundred and forty-one cases of tubercle of the alimentary canal. They are the only authorities who find it frequent. Professor Parrot has only observed it once out of numerous autopsies. Wilson Fox has met with one case, but the tubercles commenced in the peritoneum and ulcerated through into the stomach, causing perforation. Bignon has recorded one case in which perforation occurred in the site of a tubercular ulcer, attended by copious hæmatemesis. Professor Ewald,¹ of Berlin, further mentions several other observers who have recorded one or two cases. Wilson Fox does not attribute to the affection any special symptoms, though in a few of the reported cases vomiting has been said to be present. Of *non-tubercular* cases the *follicular* ulcerations have been mentioned as an accompaniment of chronic gastritis. It is suggested² that these minute ulcers situated at the mouths of the follicles are due in some measure to the presence of irritating secretions, though probably in part degenerative in character, and occurring shortly before death. Others (as Fenwick) attribute them in part to post-mortem gastric solution. *Simple ulcer* of the stomach occurs as a coincident affection in phthisical patients. It has been stated that phthisis predisposes to the formation of ulcer by the tendency to stasis and obstruction of the circulation, and so to the production of an embolus or thrombus;³ but the fact that the proportion of cases of gastric ulcer is no larger in phthisis than in other diseases appears to negative this view.

Brinton⁴ affirms that in several hundred cases of simple ulcer of the stomach a proportion of nineteen to twenty per hundred also suffered

¹ Ewald: Loc. cit.

² Brinton: Diseases of the Stomach, 1859, p. 182.

³ Fagge: Principles and Practice of Medicine (on "Virchow's embolic theory").

⁴ Habershon: Diseases of the Abdomen; fourth ed., p. 166.

from pulmonary consumption; but he asserts that about the same average of tubercular cases exists in cancer of the stomach.

From the records of two hundred cases of gastric ulcer (simple) derived from my father's private case books I can only find *three* in whom signs of tubercle of the lungs were present.

IV. CENTRAL VOMITING DUE TO THE IRRITATION OF TUBERCLE AT THE BASE OF THE BRAIN (TUBERCULAR MENINGITIS).

All the preceding forms of vomiting in a tubercular subject, with the exception, perhaps, of some cases of so-called mechanical vomiting, are reflex in character.

The cases that I have now briefly to describe are due to a direct irritation of the medullary centre, from the deposit of tubercles in its neighborhood.

The history and literature of tubercular meningitis has been fully given by Barthez and Rilliet in their "*Maladies des Enfants*." Even the most ancient authors appear to have noted the existence of this affection; but the earliest complete description is found in a remarkable treatise by Robert Whytt, in 1768, under the title of "*Dropsy of the Brain*." As far as the symptomatology is concerned, succeeding authors have not added much to his account. It was not, however, until many years later, that it was recognized that there was a distinct element at work to produce the local inflammatory appearances observed. According to the above authors, though Senn, in 1825, and Guersant, in 1827, noted that the meningitis was of a granular form and even that tubercles were present in other organs, it is placed to the credit of Papavoine that he first appreciated the tubercular nature of these granules.

In brief, the disease is characterized post-mortem by:

1. Inflammatory appearances, comprising congestion of the vessels of the pia mater (not always present) whereby the small vessels become injected and arborescent—an effusion of fluid œdema or lymph into the meshes of the pia mater, serous and more rarely purulent, with occasionally patches of semi-transparent, or gelatinous-looking lymph—a considerable excess of serous fluid in the ventricles of the brain which often become distended.

2. Softening of the cortical parts of the brain and of the basal ganglia beneath the lining membrane of the ventricles (the septum lucidum is a favorite seat of softening).

3. The presence of small, granular, tubercular foci (miliary tubercles) in the pia mater in the immediate neighborhood of the vessels, or in the vascular wall. These tubercles are milk-white or opalescent in color, or appear as translucent granules; or they may be of a yellow color. A common situation is along the course of the middle meningeal artery,

and extending into the Sylvian fissure and at the base around the vessels of the circle of Willis. They may be abundant in these situations, and on the surface of the cerebrum and in the longitudinal and other fissures, also upon the cerebellar surface, the crura cerebri, or even as minute granules upon the surface of the ependyma of the ventricles (the great basal ganglia). On the other hand, one or two tubercles only may be found.

4. Occasionally small masses of cheesy tubercle are found in the cortical layers of the cerebrum, or in other parts of the brain substance.

Tubercular meningitis occurs more frequently in children or young adults, though no age is exempt. Fagge¹ mentions that in the cases occurring at Guy's Hospital since 1854 sixty-five were in persons below the age of twenty (between the ages of six months and twenty years), and fifty-nine were above twenty years of age, but thirty-one of these occurred below the age of thirty, and only fourteen above forty-one years. Dr. Gee² shows, from statistics, that a large number of cases occur in children, and that the frequency appears to diminish after the age of eleven; but he considers the figures of statistics fallacious, for the reason that the disease is probably more common below the age of two years, as well as in adult life; because such cases are not always brought to hospital, and in the latter case are frequently not diagnosticated.

The disease may occur in rare cases as a primary affection, with or without premonitory symptoms, and without previous evidence of the presence of tuberculosis of other organs. Undoubted cases are recorded where no tubercle has been found post-mortem except in the membranes of the brain, and it is the opinion of most authorities that the affection is sometimes primary. Still, there is always the suspicion that a deposit of tubercle in bone or gland or other organ may have been overlooked. Far more commonly it is an event secondary to the deposit of tubercle elsewhere, and it occurs in two classes of cases: 1. When the tuberculosis is only slightly advanced or latent, evidencing itself by a failure of health for weeks or months previous to the onset of the disease, and possibly unrecognized. 2. As a coincident or metastatic affection occurring in the course of tubercular disease of lungs, larynx, abdomen, or of any organ, of scrofulous disease of bones, or during the course of an attack of acute miliary tuberculosis.

I have not space to enter fully into an account of the symptoms of the disease. The authorities whom I have quoted (Barthez and Rilliet), and Dr. Gee, in an admirable article in Reynolds' *System of Medicine*, describe these with great completeness. I concern myself chiefly with the diagnostic importance of the symptom of vomiting. In children

¹ Fagge's Principles and Practice of Medicine, vol. i.

² Gee: Article on "Tubercular Meningitis" in Reynolds' System of Medicine, vol. ii.

there is, as a rule, a prodromal period, perhaps, of some weeks or longer. This period is marked by debility, loss of flesh, pallor, and general slight disorder of functions. The appetite is lost, and there is languor or irritability. Drowsiness is a not infrequent precursor, and in infants is an important sign. In older children and adults an alteration in mental activity is early recognized. Those who are bright and quick become distracted, inattentive to lessons, and easily fatigued by work and intellectual pursuits. At night there is restlessness, frightful dreams, grinding of the teeth, or, in infants, screaming. Sooner or later the symptoms of the cerebral disease manifest themselves by vomiting. And in a child in whom such a change in temperament or mental condition has been noticed this symptom usually is the first to cause alarm. The vomiting is commonly after a meal, and consists of the food taken; but it may occur repeatedly, and is then often bilious in character. Vomiting seldom lasts more than a day or two, or at most for seven or eight days, but cases are recorded in which the symptom has lasted for several weeks before the invasion period. (Rilliet records a case in which vomiting occurred for two months before the attack.) Dr. Gee states that when vomiting has ceased for twenty-four hours it rarely, if ever, returns. With the vomiting headache is a prominent symptom, and other signs of brain irritation speedily ensue. The pulse shows abnormal fluctuation, is too frequent, or, perhaps, slow and irregular, the pupils are inactive, and the optic discs congested. Squint is common, and diplopia in the adult, and with all these there is a febrile condition (as a rule) and the patient becomes increasingly drowsy and vacant. Sooner or later, perhaps in a week, in typical cases, this irritative stage passes into that in which more definite signs of compression are marked. Paralytic symptoms of cranial or other nerves, convulsive seizures, and a state of unconsciousness, with dilated pupils, rapid, irregular or intermittent pulse, Cheyne-Stokes breathing, the hydrocephalic cry (in children) finally passing into complete coma, and terminating in death. The disease may present great varieties in the length of the stages, extending in some over two or three weeks; while in others, especially if the meningitis is part of a general tuberculosis, the whole course may be run in three or four days.

In adults the disease is more rapid. It commences, in many cases, with suddenness and without a prodromal period, and is therefore less easily recognized.

Vomiting is present, according to Dr. Gee, both early and in almost every case; while Dr. Fagge has seen several in whom no vomiting was present.

Headache, when the attack is gradual in its onset, is invariable, but in some cases the disease is ushered in by convulsive or paralytic symptoms, with delirium or partial unconsciousness.

Vomiting in these cases is dependent on the deposit of tubercle at the base; and hence, when the affection is limited to the convex surface of the brain, as in some of Dr. Gee's cases, it is to be expected that vomiting would be absent.

In many cases, where the meningitis supervenes during well-marked tubercular affection of other organs, the premonitory symptoms are either unnoticed or attributed to the general disease. It is in these that the occurrence of vomiting becomes an important diagnostic sign, especially if it occurs for the first time. Should the temperature, previously raised at night one or two degrees above the normal, become abnormally low, it is an additional reason for suspicion of the cerebral affection. I have observed this in several cases; but I do not know that it occurs in acute tuberculosis.

Barthez and Rilliet agree that all authors since the time of Robert Whytt are unanimous upon the value of vomiting as an indication of meningitis.

TREATMENT.—It is, perhaps, a truism to assert that the treatment of dyspepsia and of vomiting in phthisis should be directed toward subduing the progress of the lung disease. It is certain, however, that while local measures are necessary and even indispensable in some phases of the malady, they will eventually fail or have no permanent effect if the general treatment is neglected. As I have hinted, at the commencement of this article, this is especially the case in all the early stages of phthisis, or where gastric disorders have developed in a tubercular subject before any disease in the lungs could be detected. In cases of dyspepsia which seem unusually intractable it is a wise caution to examine the lungs, not on one occasion only, but repeatedly. An early clew may thus be gained as to the cause of the delicacy, and appropriate remedies applied. For such cases, as well as for all forms of atonic dyspepsia, it is unnecessary to insist on the great importance of pure and bracing air, and of residence on dry soil, to supplement the medicinal treatment. Nowadays, with our numerous convalescent homes, this is not impossible even in the out-patient practice of our large hospitals, and I have frequently had opportunities of putting my advice thus into practice. I cannot here enter into so large a subject as the general climatic or other treatment of phthisis. I desire rather to confine my few remarks to the remedial measures that I have found of value in the classes of vomiting which have been alluded to, where the symptom is of sufficient importance to need attention.

In all forms of vomiting certain general principles must be borne in mind.

Food of a bland and easily digestible kind should be ordered, and nothing irritating to any part of the mucous membrane of the alimentary tract should be allowed, either in the shape of food or drink—such,

for instance, as condiments, vinegar, acid drinks, or alcohol in any concentrated form.

When vomiting is frequent or severe, it is hopeless to attempt to treat the patient unless rest in a recumbent position is insisted upon. In such cases also, liquid nourishment is advisable.

This is obvious enough when the symptom is the result of gastritis, but it is equally applicable in the distressing vomiting that sometimes results from the cough.

The sympathetic vomiting from irritation of the pulmonary branches of the vagus is most intractable and difficult to deal with. I have, however, several times seen the vomiting subside as soon as the patient was kept in bed and put on liquid diet. Medicinal treatment alone without these precautions will invariably fail. The object should be to allay any irritability of stomach that may be present, and bismuth in the form of carbonate or subnitrate, with bicarbonate of soda and some sedative, such as opium or morphia, hydrocyanic acid, or bromide of potassium, should be given internally. Soda-water is a valuable sedative, and is suitable either alone or with milk.

It must be remembered that the tendency of vomiting, from this cause, is to cease after a time as the disease in the lungs progresses.

In the large class of cases described under the name of *mechanical vomiting*, it has been seen that there is frequently an irritability of throat or stomach present.

In the throat affection, soothing and slightly astringent gargles will do much to lessen the irritability, and this applies also to all forms of pharyngeal irritation, from simple catarrh to the more painful forms of ulceration of soft palate or pharynx. I have found great advantage ensue from the use of a sedative gargle of bromide of potassium and opium in combination. To these I frequently add a mild astringent such as borax. Some cases of longer duration are benefited by more powerful astringents, alum or tannin, but these should be combined with opium or some topical anodyne. For ulceration of the fauces a powder of iodoform, borax, and morphia dusted or blown upon the ulcerated surface once or twice daily will frequently give great relief. When the throat is not specially sensitive the difficulty of expelling the sputum often gives rise to exhausting efforts of coughing. This is not always easy to deal with.

The internal use of expectorant remedies combined with iodide of potassium (three to five grains are usually sufficient), or alkalies, will do much to aid in the expulsion of secretion. Opiates may be given in small doses when the amount of secretion is small and there is an undue irritability of the smaller bronchial tubes. If, as in some cases, there is any degree of spasm of the small bronchi, iodide of potassium and carbonate of ammonium in small doses are invaluable.

remedy too frequently, as symptoms are very easily produced from absorption of the drug.

Much might be said on the treatment of gastric catarrh, but the space at my disposal is limited, and, rather than deal with it in a cursory manner, I would refer the reader to the excellent treatises of Brinton, Wilson Fox, and my father, who among many other authors have written upon the subject.

Suffice it to say, that absolute rest, suitable and unirritating forms of nourishment, fluid diet if necessary, and alkaline sedative remedies are the well-known principles on which such cases should be treated.

It is impossible to lay too much stress upon the importance of successfully coping with the various gastric disturbances that arise in the course of phthisis. The elements of success are assured when a correct diagnosis has been made as to the cause of the symptoms. Hence I have labored to define and classify these causes in the hope that my experience may be of help to those who, like myself, are daily brought in contact with one or other phase of this terrible and far-reaching scourge.

FIFTY-FOUR CASES OF MOLAR PREGNANCY.

BY THEOPHILUS PARVIN, M.D.,

OF PHILADELPHIA.

THE statistics here presented are of cases in which the product of conception presented those appearances which have given it the name of *Fleischmole*, *mola carnosae*, or flesh-mole. This application of the term mole, as well as its use, qualified by the word cystic, to what is generally spoken of as hydatidiform degeneration of the placenta, is not unobjectionable, and is less frequent than formerly. Nevertheless, flesh-mole or fleshy mole indicates so well the obvious appearances of the expelled mass in certain abortions that it may be properly retained.

Roederer (*Elementa Artis Obstetricæ*) thus defined a mole: "*Ovum deforme, in quo partes embryonis et secundarum distingui vix possunt, molam vocabimus.*" Dionis, under the head of *faux germe*, speaks of this "fleshy body" as having the form and solidity of a young turkey's gizzard, and again of its being the size of a small egg.

The first table following contains twenty-two cases from the records of the Munich Frauen-Klinik, kindly given me at Dr. Winckel's request by his assistant, Dr. Lamping. The second table includes twenty-seven cases obtained from the library of the College of Physicians, Philadelphia. After the tables five additional cases will be presented, one of them given me by Dr. Winckel when I was in Munich in August, 1891.

CASES OF MOLAR PREGNANCY. TABLE I.

No.	Name.	Age.	Number of labors and miscarriages.	Date of last menstruation.	Date of expulsion.	Previous health.	Hemorrhage.	Expulsion spontaneous.	Character of mass expelled.	Recovery.
1	Frau S.	32	5 normal labors.	Middle of November.	January 21.	Influenza with fever for eight days. Good.	Eight days.	Spontaneous.	Death of embryo from disease of circulation.	Yes.
2	Maria J. unmarried.	22	Second pregnancy	October 20.	January 23.	Good.	Severe bleeding.	Spontaneous.	Chorion and circumflex decidua separated from the amnion.	Yes.
3	Frau St.	38	10 pregnancies; 3 living children; 3 dead-born; 3 miscarriages.	November 8.	February 1.	Light bleeding during pregnancy. End of December severe influenza.	Severe bleeding.	Normal.	.....	Yes.
4	Frau S.	23	iii-para. Normal labors.	November 2. to December 2	February 1.	Good.	Severe bleeding.	Normal.		
5	Frau Y.	23	i-para.	Middle of November.	February 28.	Good.	Moderately severe bleeding.	Spontaneous.		
6	Frau F.	32	ii-para. Normal births.	December 2.	March 1.	Good.	4 days bleeding.	Spontaneous.	Hemorrhage into chorion	
7	Frau F.	33	13 labors; 1 abortion.	February 9.	April 26.	Good.	Severe bleeding during expulsions	Spontaneous.		
8	Anna H. unmarried.	16	i-para.	February 7.	April 27.	Bleeding for several days.	.....	Spontaneous.	Ovum inverted into posterior wall of decidua vera; hemorrhage into decidua vera.	
9	Frau R.	35	iv-para. 1st and 2d normal; 3d child dead-born.	Beginning of February.	May 14.	Good.	Trifling bleeding.	Spontaneous.	Apoplexy of chorion.	Perfect.
10	Frau S.	26	iv-para. Normal labors.	Middle of April.	July 4.	Good.	Slight.	Spontaneous.	Hemorrhage under the amnion.	Perfect.
11	Frau B.	33	xi-para. 9 births; 1 still-born child; 1 abortion.	End of April.	July 5.	Good.	Slight.	Spontaneous.	Decidua reflexa and chorion torn.	Perfect.
12	Frau R.	34	iv-para. 3 abortions; 1 labor at term.	Beginning of May.	July 19.	Always delicate.	Severe bleeding for two days.	Spontaneous.	Apoplexy of the membranes.	Perfect.
13	Frau L.	30	vi-para. Normal births; except 5th; abortion.	End of July	Middle of October.	Heavy lifting caused abortion	Severe.	Spontaneous.	Ovum intact; large part of decidua wanting; hemorrhage in the chorion.	Perfect.
14	Frau P.	30	iv-para. Normal births.	July 14.	October 13.	Good.	Severe.	Spontaneous.		
15	Frau H.	36	v-para.	October.	Beginning of January.	Good.	Not severe.	Spontaneous.		
16	Frau R.	22	v-para. Normal births.	Middle of December.	February 24.	Good.	Slight.	Spontaneous.		
17	Frau B.	27	iv para. Normal births.	October 25.	February 25.	Frequent hemorrhages.	No bleeding.	Spontaneous.		
18	Frau D.	7	iv-para. 2 normal; premature.	November 15	April 7.	.....	Seventeen days colic.	Spontaneous.		
19	Frau X.	32	v-para. Normal births.	February 4.	April 26.	.....	Hemorrhage one day.	Spontaneous.		
20	Frau N (?)	24	viii-para. 4 children; 3 abortions.	February 22	May 20.	Good.	Very severe bleeding.	Spontaneous.	Hemorrhage in chorion.	
21	Frau N (?)	37	xii-para. 1 premature; others normal.	Last of Feb'y.	July 11.	Under unwise treatment.	Slight bleeding.	Spontaneous.	Superficially a series of ruptured vessels.	
22	Frau S.	22	x-para. Abortion in 2d pregnancy.	May 8.	July 27.	Severe vomiting in pregnancy.	Severe bleeding.	The ovum manually removed from os uteri.	Apoplexy of chorion and decidua reflexa.	

TABLE II.

No.	Name.	Age.	Date of delivery.	Number of labors and miscarriages previous.	Last menstruation.	Hemorrhage.	Delivery: spontaneous, manual, instrumental.	Former health.	Character or condition of expelled mola.	Recovery.	Accoucheur.	Where reported.
1	?	?	January, 1880	3 labors; 1 miscarriage six months previous (Aug 1885)	Spring, 1885.	Constant oozing since miscarriage.	Few hours after vigorous curetting of uterus.	Good up to date of miscarriage.	Round, fleshy mass, with remains of amniotic sac visible at lower portion. On section soft, spongy, suggestive of hypertrophied placental tissue. Microscopical examination failed to reveal remains of chorionic villi; tissue largely myxomatous.	Yes	Gillette.	Am. Journ. Obst., 1886, p. 403-5.
2	Mrs. A.	25	April 8, 1841	7 pregnancies, (3 of these had resulted in anomalous productions which were expelled at full term.	July, 1840.	Slight.	Spontaneous	Good up to 8th month.	Masses of putrid coagula of blood, very dark, very offensive, enveloped in a membranous sac, the whole being of a rounded form. Microscopically, consisted of a cellular structure, the cells inclosing a caseous matter.	Yes	John Grove.	Lancet, 1840-41, ii. 368-70.
3	Mrs. A.	32	June 12, 1878	3 labors.	January 14, 1878; continued flow since.	Profuse, daily for 5 months previous to delivery of mola.	9 hours after introduction of uterine sound.	Good to January 1878.	Ovoid mass, size 6 x 4 inches; placental tissue over the surface; uniformly hard and resisting to the touch. Tissue dense with central cavity less than three inches deep, containing no fluid.	Good but slow.	E. S. Dunster.	Mich. Med. News, Detroit, 1869.
4	?	26	Feb. 10, 1833	3 labors.	Feb., 1832.	Moderate for 8 or 9 mos.	12 hours after exhibition of powerful dose of cathartic medicine.	Good to May, 1832.	Mass size of fist; solid. Surface smooth, rounded, with remains of thin areolar membrane attached to it. Section presented a vascular surface composed of tough and organized lymph, containing bundles of delicate white fibro-cellular tissue.	Yes	Hutchinson.	Trans. Path. Soc., Lond., 1852-53, iv. 217.
5	?	41	1871	8 labors.	13 months before delivery of mola. (History of fall at the 6th month.)	Considerable at time of delivery of mola.	Few hours after introduction of sound.	Good.	Thick cast of the interior of the uterus, with walls one-third inch in thickness. Corresponded exactly in size with the enlargement of the uterus.	Yes	Thomas More Madden.	Med. Press and Circ., March 18, 1871
6	Mrs. C.	24	Aug 17, 1814	3 labors; 1 miscarriage.	4 months previous to discharge of mola.	Slight for week before delivery; profuse at time of delivery.	Spontaneous	Good.	Oblong fleshy cake, three inches in diameter, possessing every characteristic of a natural placenta, and having a membranous bag connected with it. Whole surface of mass covered with tumors in clusters, livid fleshy-brown in color, containing coagulated blood.	Yes	M. Lamon.	Edinb. Med. and Surg. Journ., 1815, xi. 96-100.
7	?	?	Oct. 3, 1869	Miscarriage at 4 months; July 8, 1869; placenta retained.	7 months previous to delivery of mola.	?	Spontaneous	?	Globular mass, shape of the cavity of the womb. On section, composed of white fibrous tissue with a vascular stroma.	Yes	Newman.	N. Y. Med. Rec., Dec. 1, 1869.

8	?	?	2 labors.	10 or 11 mos. previous to delivery of mole.	Profuse for two weeks before delivery.	Manual.	?	Organized body weighing 6 or 8 ounces; in color and consistence resembling liver upon its upper surface, with white tendinous cords attached to its inner portion. Inner surface ragged, and attached to it were numerous clusters of little granular bodies resembling the roe of fish, but exceedingly tenacious. The difference between the clusters of the organized substance and hydatids consisted mainly in their solid, tough, granular feel, rolling between the fingers like small shot. The portion of the mass from which they were suspended was fleshy and in some parts tendinous.	Yes	Jos. Parrish.	New Jersey Med. Reporter, June, 1861.
9	Mme. X.	21	1 labor two days previous to discharge of mole.	8 months previous.	None.	Spontaneous	Good.	Mass of a dirty white, yellowish color, dense, rough on the surface, slightly vascular, and very fatty. Its volume almost equalled that of the two fists.	Yes	Pichon.	Gaz. d. Hôp., Paris, 1865, xxvii. 169.
10	Negress	35	June 10, 1859	Jan., 1850.	Considerable at time of delivery of mole.	Spontaneous	Delicate health since birth of last child 3 years before.	Mass of heterogeneous matter consisting of lumps of fatty material of irregular size enclosed in a delicate pellicle or fibrous membrane; in the fat was a number of lumps of various shapes and sizes, from that of a walnut down, some resembling clotted blood, and others musculo tissue. The entire mass filled a gallon measure. Mass size of fist. "Presented the usual appearance belonging to the carneous mole."	Yes	R. Quinney.	New Orleans Med. and Surg. Journ., Sept., 1859.
11	Mrs. W.	30	March 20, 1878	One year previous.	Considerable at time of delivery of mole. Dark yellowish discharge with foul odor after 4th month of delivery.	Spontaneous	?	Mass size of fist. "Presented the usual appearance belonging to the carneous mole."	Yes	Underhill.	Am. Journ. Obst., March, 1879.
12	Mrs. M.	34	Dec. 24, 1884	March, 1884	Since June, 1884, continuous brownish watery discharge, of bad odor, and occasionally bloody.	Spontaneous	Good.	Mass size of full-term placenta; heavy, dense, with a hard fibrous feel. Membranes intact. Central cavity containing about half a pint of dirty-colored liquor amnii. At the bottom of the cavity were a number of large varicose veins.	Good	Schoolfield.	Cin. Lancet and Clinic, 1885, xv. 95.

No.	Name.	Age.	Date of delivery.	Number of labors and miscarriages.	Last menstruation.	Hemorrhage.	Delivery: spontaneous, manual, instrument?	Former health.	Character or condition of expelled mole.	Recovery.	Accoucheur.	Where reported.
13	?	?	?	?	?	Very profuse at time of delivery.	Instrumental—blunt hook and curette.	?	Mass resembling placental tissue, firmly adherent to uterine fundus.	Yes	L. Wolff and Dr. A. Reported by Rosenthal.	Journ. Amer. Med. Assoc., 1898, 255-262.
14	German woman	?	?	?	2 or 3 mos. prior to delivery of mole.	Profuse at time of delivery.	Spontaneous	Good.	?	Yes	Ditto.	Ditto.
15	German woman	30	?	?	?	Profuse at time of delivery.	Instrumental—Beecher's placental forceps	?	Round soft mass, firmly adherent to uterine wall. Pedicular portion had undergone distinct fatty degeneration.	Yes	Ditto.	Ditto.
16	Mrs. C. Italian.	?	?	?	?	Profuse at time of delivery.	Instrumental—Beecher's forceps with blunt curette.	?	?	Yes	Ditto.	Ditto.
17	Mrs. N.	35	?	Sterile.	10 weeks prior to delivery of mole.	Profuse at time of delivery.	Spontaneous after tamponage and use of ergot.	?	Mass size of an orange, round and somewhat firm; surface irregular and covered with clotted blood. Section showed a compact texture with a small central cavity lined by serous membrane and containing a small quantity of fluid.	Rapid	E. Rosenthal.	Ditto.
18	Hungarian woman.	40	?	?	?	Slight at time of delivery.	Spontaneous	Good.	Large fleshy mass about the size of a fetal head; walls about three inches thick containing small cavities filled with blood. Central cavity lined with serous membrane containing some fluid.	Yes	Ditto.	Ditto.
19	Mrs. H. Polish woman.	38	?	5 labors; 3 miscarriages	Over a year before delivery of mole.	Constant dribbling for 4 mos. prior to delivery.	Instrumental—placental forceps, curette, blunt hook.	?	Mass composed of very dense fibrous tissue with here and there small pellicles of calcareous deposits.	Good	Ditto.	Ditto.
20	Mrs. B. F.	33	?	4 miscarriages, then a pair of living twins. One year later gave premature birth to 7	?	None.	Spontaneous	?	Large fleshy mass, size of adult head, pillable, easily moulded, with small central cavity containing a small amount of fluid.	Good	Ditto.	Ditto.

21	Mrs H. 45	May 2, 1848	mos. twins; one year later gave birth to full term child and present mole. ?	Menstruat'n ceased for 7 months, and then reap- peared, tho' irregular as to time and quantity. 6 years later was deliver- ed of a living child. Men- ses then re- sumed, tho' their irregu- lar character until deliv- ery of mole fifteen years after origi- nal trouble.	For 6 mos. prior to de- livery of mole had a constant dis- charge of sanious and purulent fluid, to- gether with small frag- ments of ossific matter size of finger nail to mere powder; and frequently irregular masses were passed, some weighing over an ounce.	Manual.	?	Homogeneous conglomerate mass, weighing about 4½ pounds, of a yellowish color, resembling healthy liver in consistence, but much more elastic, and covered exter- nally with scales of ossific matter. Mass was 10 inches long, 4 inches wide, 2 to 3 inches thick; wedge-shaped. Nearly a gallon of semi-purulent fluid, extremely offensive, escaped after the delivery of the mass.	Slow	R. R. Stone.	Northwest'n Med. and Surg. Journ., Chicago, Aug. and Sept. 1848.
22	Mrs S. 30	Feb. 6, 1883	3 labors. Not men- struated since birth of last child 5 months be- fore.	Slight since January 19, 1883. Con- siderable for few days be- fore delivery of mole.	Spontaneous after admin- istration of ergot.	?	Pear-shaped body resembling placenta tis- sue.	Good	O. V. Thayer.	Pacific Med. and Surg. Journ., May, 1883.	
23	Mrs. F. 25	April 22, 1890	? July, 1880.	On Dec. 25, 1889, hem- orrhage of 1 or 2 ounces repeated at irregular in- tervals for 8 weeks. Slight at time of de- livery of mole.	Spontaneous	Good.	Mass the size of a large fig resembling placental tissue.	Yes	H. F. Vickney	Boston Med. and Surg. Journ., Oct. 30, 1890	

No.	Name.	Age.	Date of delivery.	Number of labors and miscarriages.	Last menstruation.	Hemorrhage.	Delivery: spontaneous manual, instrument?	Former health.	Character or condition of expelled mole.	Recovery.	Accoucheur.	Where reported.
24	?	?	Oct. 12, 1877	7 labors. Three days after discharge of mole a highly decomposed 4½ mos. fetus was discharged; placenta adherent and rotten, was removed by hand.	June 1, 1877	Profuse bloody discharge, thin, black, and offensive, from Sept 20	Spontaneous	Good	Dense mass, size of hand, two fingers thick; covered with serous membrane; adherent to the side of the uterus for a space the size of a dollar. On section, the color and texture resembled liver. The mass was of the form and appearance of liver.	Good	Caspari.	Deutsche med. Woch., Berlin, 1878, iv. 30.
25	C. R.	37	June 6, 1846	10 pregnancies. (Each of these ten pregnancies resulted in a well developed fetus of 5-7 mos, accompanied with a mole as in present instance, attended with severe hemorrhages).	?	Mild for some time before delivery of mole; severe at time of delivery.	Manual.	?	Mass weighing 12 ounces. One and a half hours later a six or seven monthis fetus together with the placenta was discharged.	Yes	Majer.	Med. Corr.-Blatt. d. Wurttemberg, arztl.ver. Stutt., 1847, xvii. 301.
26	Frau S.	?	?	?	?	From birth of child 18 days before until delivery of mole.	Spontaneous	?	Long, round, fleshy mass, size of a pigeon, weighing 1½ pounds. Outer surface covered with sero-fibrous membrane to which fatty particles were adherent. Section revealed a fasciculated mesh.	Yes	J. Kraus.	Allg. Wien. Med. Zeig., 1866, xi. 273.
27	?	?	1866	8 labors.	7 months before delivery of mole.	Slight from middle of second month up to delivery of mole, and insertion of catheter.	Manual, 46 hours after administration of ergot.	?	Mass size of an apple, presenting the ordinary characteristics of a fleshy mole.	Good	O. v. Forunquo.	Wien. med. Presse, 1866, vii. 233-235

Desirous of knowing whether endometritis had any obvious part in the etiology of molar pregnancy, I had one of the headings in the tables relating to it, but as in not a single instance was any reference made to the disease, I have omitted this heading in the published tables.

For the following case I am indebted to Dr. Charles L. Spivak:¹

The patient was twenty years of age; ten months married, and the last menstruation was three months after. During the seven months there was some abdominal enlargement and no threatening of miscarriage, except there was twice slight discharge of blood. In the examination a uterine sound was introduced, but immediately withdrawn when found to have penetrated five inches. Six hours after the introduction of the sound uterine contractions began, and thirty-five hours after their commencing a fleshy mole the size of the fist was removed with placental forceps.

The next two cases illustrate the fact that there may be a plural conception in some cases of molar pregnancy:

Frau —, had two normal pregnancies; then, after four months and a half absence of menstruation, expelled an ovum corresponding to the third month, and, three days after, a flesh-mole the size of a walnut; it had an amnial sac containing only fluid.²

Frau —; seven pregnancies—one with twins—and then the eighth pregnancy began, in October; labor occurred in July. First there was a mole the size of two fists expelled—*mola carnos*a—and then a *traubenmole* weighing five pounds. A year afterward this woman gave birth to a healthy child at term.³

It is an interesting fact, which may be stated in this connection, that La Motte (*Traité des Accouchemens*, Observation XIV.) narrates a case in which, after the removal of one mole, the hemorrhage not ceasing, he removed a second, and then the flow stopped. This writer, whose reports of cases are always interesting and often very instructive, gave other illustrations of molar pregnancy, stating that one of the characteristics of such pregnancy was an increase of size much greater than corresponded with the period of pregnancy; thus, a woman at two and a half months would be as large as she ought to be at five months of normal pregnancy. Nevertheless, notwithstanding the usual accuracy of this great obstetrician's observations, such rapid abdominal enlargement is characteristic of an "hydatid," rather than of a "fleshy" molar pregnancy.

The following is the report of a case under Dr. Winckel's care and given me by him:

Frau F. came under my care January 5, 1885. She was twenty-five years old, and married seven months; she suffered from dysmenorrhœa,

¹ Personal communication.

² Monat. f. Geburtskunde und Frauenkrankheiten, Berlin, 1859.

³ Berlin. klin. Wochenschr., 1873.

with scanty flow. Treatment: Infusion of hyoscyamus leaves, and Lugol's solution locally applied. May 18, 1885, the flow was more abundant and without pain. High altitude, Rigi, and cold bathing. July, 1885, conceived. First vomiting, August 4th. Menses absent in August and September. October 28th, threatened miscarriage. November and December, the uterus ceased to increase in size; condition of patient good. January 9th, seventy-three days after the threatened abortion—that is, at the end of six months of pregnancy—profuse discharge of blood, and January 10th—that is, on the one hundred and sixty-eighth day—there was expelled a mass the size of a hen's egg, in which the embryo is not found; the amniotic liquor is cloudy, and the chorion contains small apoplectic areas. Puerperium normal. Then albuminate of iron was given. She conceived again in August, 1886; was constantly in bed from September 9th to the 30th and again from October 8th to November 30th. She went to term, and was delivered, May 3d, with forceps, on account of danger to the child. She has been perfectly well, but has not again become pregnant.

My own case is briefly as follows:

Mrs. —, about thirty years of age, has given birth to three children and has had two miscarriages. When she consulted me she supposed herself to have completed six months of pregnancy; was confident there was abdominal enlargement, and believed that she had felt foetal movements. In the third month of pregnancy she was threatened with miscarriage first, and subsequently the danger seemed so imminent that at one time she remained in bed for five weeks, and used occasionally opium suppositories. Examining the uterus I found it about twice the size of the unimpregnated organ, but its development did not approximate that of six months. I assured her that either she was not pregnant at all or else the embryo had perished some time before. I suggested to her instead of confinement to the house, still less to the bed, a ride on horseback. She took a ride the following day—in a carriage, however—and at night I was sent for, and found her suffering with regular uterine contractions and some flow of blood, by no means great. In two hours after my arrival a mole nearly the size of the palm of my hand was expelled; this mass, when placed with its uterine surface upon a plate, presented an elevation not dissimilar to that of a watch-crystal upon the face of the watch, and was caused by the amnion raised by between one and two tablespoonfuls of liquor, which was only slightly cloudy, and contained no trace of an embryo. Her convalescence was satisfactory.

The brief history enforces this truth, that when in a pregnancy the uterus ceases to enlarge, its size in a given time being much less than normal, it is unwise to endeavor to avert or to postpone a miscarriage.

In examining these tables one is struck by the fact that the first is rarely a molar pregnancy; there were only four primigravidæ in fifty-four; some of the women had ten, one eleven, another twelve previous pregnancies.

Endometritis has been suggested as one of the causes of molar pregnancy. Thus, a recent writer,¹ reporting some cases occurring in his

¹ *Annals of Gynecology and Pædiatrics*, May, 1891.

practice, observes: "I am inclined to think that a disease of the uterus, especially of the endometrium, plays an important part in the causation in many cases, and may be aided by a debilitated condition of the system." But this hypothesis finds no support in these reports, for endometritis is not mentioned as being present in a single case; moreover, several women are stated to have had a normal soon following the abnormal pregnancy. Indeed, so far as careful examination of these moles testifies, the condition of the chorion¹ has more to do with their production than that of the decidua. It seems to me, however, it would be a mistake to reject disease of the endometrium as a possible cause, and this opinion is confirmed by a recent case under my care, in which such disease was present both previous to the conception and after the expulsion of the mole. Indeed, so strongly am I impressed with this possible etiology in some cases, that if recurrence of this accident was observed, the recurrence being after a brief interval, my belief is that careful examination would discover an endometritis, the appropriate treatment of which might avert a succeeding abnormal pregnancy.

Several of the histories show that Nature is ready, upon slight provocation, to cast off the abnormal product; the uterus is, as it were, in a condition of unstable equilibrium, and tampon, catharsis, or the gentle use of the uterine sound may disturb that equilibrium, exciting its activity.

If uterine action has begun, is interference by active means advisable? When we remember that in twenty-three cases collected in Munich the issue was unassisted—save in one case, in which the hand was employed to remove the detached mass from the os uteri—we may doubt whether placental forceps and curettes will be required, save in the rarest cases. Daily antiseptic vaginal injections may be advisable if the process of detachment and expulsion is slow, and the tampon and ergot if there be much hemorrhage.

So far as can be established by these statistics, the average duration of a molar pregnancy is a little more than four months; such pregnancy may last only two months or extend to twelve. It is probable that in many cases opium, rest, and similar means were employed to prevent miscarriage, and thus this occurrence was often delayed. Therefore, it may be regarded as almost certain that the average duration of this abnormal pregnancy should be stated as between three and four months.

¹ The same fact, too, is shown in a case reported by Dr. Edis (*British Medical Journal*, Nov. 2, 1889); it is stated that the specimen showed there had been "hemorrhage into the chorion."

TREATMENT OF SACCULATED AORTIC ANEURISM BY ELECTROLYSIS THROUGH INTRODUCED WIRE.¹

REPORT OF A CASE.

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THE therapy commonly adopted for the cure of aortic aneurism, whether of the arch or the descending portion, usually offers so little promise of success, that any method suggested to supplement or substitute this, if attended with little risk to the patient and supported by the slightest clinical evidence, merits careful consideration. The frequent utter inutility of medical treatment in cases of aneurism which, from their situation or character, are insusceptible of extinction by deligation or by compression, necessitates an earnest search for another method.

As the cure of aneurism can only result through obliteration of the sac cavity by the formation therein of firm thrombi, which in process of time undergo organization with contraction of the sac wall, so all plans of treatment suggested have as their basis the production of organizable clot. The ideal method of promoting this would be that of introducing into the sac a harmless substance that would act by virtue of its vital or chemical properties; such a substance has not yet been found among the medicinal hæmostatics. Experiments made by the late Dr. Wooldridge² tend to indicate that it may exist in lecithin or in tissue fibrinogen—that the fibrin factors of the blood may, under skilful manipulation, be so modified that these can be introduced without risk of the coagulum so induced spreading beyond the sac boundaries into the vessel. As yet this hope has not been realized.

Multiple galvano-puncture, with the use of strong currents, the anode the active pole, the cathode externally—in brief, the process conducted in a manner conducive to the best results with least risk, if good results were possible—has, beyond doubt, proved a failure in the therapy of aneurism.³ Although the method is practically devoid of danger when

¹ Read before the College of Physicians of Philadelphia, March 2, 1892.

² See paper by Powell, "On the Diagnosis and Treatment of Aneurism of the Aorta," *Lancet*, January 4, 1890.

³ Practised as advocated in text-books on electricity the treatment is useless indeed. A recent work—Liebig and Rohé's—recommends a current-strength of but twenty to thirty milliampères, and this applied for but ten minutes. The inter-polar resistance is so great with one electrode externally, that an electrolytic action to any purpose necessitates a current strength, and the duration of its application, much in excess of this. Fifty milliampères are none too great nor an hour too long, if permanent results are to be hoped for. No greater risk attends the application of a strong current and a long session, than a weaker current and a short session, provided the needles are properly

carefully carried out, it is also, it must be added, apparently practically devoid of benefit; for though firm coagula are perhaps often induced, they are of such small dimensions, and offer so little obstruction to the blood-current, that their dissolution rather than their accretion and organization usually quickly results. The slight amelioration in symptoms, though promptly occurring, is of most ephemeral duration. Occasionally a "cure" is reported, yet this is so exceptional that the method must now be looked upon as scarce worthy of further trial.¹

It must be briefly inquired, if the method originated and first practiced by Moore, of London—that of permanent introduction of filiform material into the sac which acts merely mechanically, by offering multiple surfaces for clotting and by impeding the blood stream, permitting the latter to whip itself about the former—is more promising than that of galvano-puncture. That it is theoretically so there is no doubt, the two factors most important in cure being here furnished. It is not surprising, therefore, that since Moore, in 1864, attempted, by the method which has since been called by his name, to delay the fatal issue in a hopeless case of thoracic aortic aneurism, that the possibilities this treatment suggests should have caused it to be viewed with favor. It is, on the other hand, more curious that an interval of seven years should have been permitted to elapse before the method was tried a second time, possessing the theoretical advantages that it does. The cause probably lay in the subsequent unfortunate result in Moore's case—inflammation of the sac and pyæmia—one that in those days seemed inherent in the operation, but which was, in truth, rather due to the bad technique—faulty in the excessive amount of wire used,² with which were also probably introduced septic germs.

Of the twelve recorded cases in which wire was inserted,³ without the insulated. See my own case, in which a current of seventy milliamperes was passed through two needles and two and a half feet of wire for an hour entirely without ill result.

¹ As to these reported *cures*, are they permanent? Unfortunately too few trouble themselves to obtain information as to later developments in rare cases of "cure" in other affections beside aneurism. The report is too often made *ad captandum*—the wonder excited is the reward desired.

² Twenty-six yards of fine iron wire were inserted—sufficient to originate much local disturbance. The wire was soft and bent in all directions (see remarks by Holmes and Hulke: Cayley's paper on a case treated with wire—*Lancet*, February 27, 1886). The aneurism was very large and seemed on the point of bursting through the skin or into the pericardium. Rapid coagulation in the sac occurred and temporary arrest of pulsation. Death resulted on the fifth day. (*Med.-Chir. Trans.*, xlvii. p. 129.)

Omitting those in which watch-springs were used, the method of Bacilli, which has nothing to recommend it, either in theory or result, over the employment of ordinary wire. The elasticity of watch-springs necessarily interferes with subsequent contraction of the sac and its contents, without which an absolute cure cannot result. Their brittleness also renders fracture likely during the process of sac-contraction. The walls of the aneurism are then endangered from contact with the sharp pieces.

conjoint employment of electrolysis, all were apparently in a more or less hopeless condition prior to operation. Yet, notwithstanding this, as regards clot-formation, reduction in the bulk of the sac, and its final obliteration, if such may be termed a cure, it would appear that two recoveries resulted, and the condition of several other of the cases was temporarily improved. In Loreta's case¹ an abdominal aneurism, the size of a foetal head at term contracted to the dimensions of a walnut, with obliteration of the sac cavity, by the seventieth day after the introduction of two yards of silvered copper wire. Death resulted subsequently from rupture of the aorta below the sac. In Morse's² case it is stated that eight weeks after the insertion of one and a half yards of one-half millimetre silver-plated copper wire into the sac of an abdominal aneurism the size of two fists, all indications of aneurism had disappeared, a hard nodule replacing the pulsating tumor. The patient remained well. In Cayley's case³ of rapidly increasing thoracic aortic aneurism on the verge of rupture, forty feet of steel wire caused complete consolidation of that portion of the sac pointing externally, without constitutional disturbance or local pain. Two months later nearly thirty-five additional feet of wire were passed into the intra-thoracic portion of the aneurism, which now showed signs of rapid increase. Death resulted from dyspnoea from the tracheal pressure, without any change occurring in the symptoms or physical signs. The size and connections of the sac were stated by Cayley to have rendered the second operation ineffectual. That part of the sac in which the wire was first introduced was found to have undergone complete solidification. In the cases of Domville,⁴ Murray,⁵ Pringle (and Morris),⁶ Lange,⁷ and Ransohoff,⁸ in which death followed the operation in a short time, the necropsies showed undoubted evidence of benefit having resulted from the introduction of wire. In Hulke's case⁹ (thirty-three feet of wire) no *intra-vitam* or *post-mortem* change attributable to the use of wire could be noted. In that of White and Gould, in which thirty-two feet of steel wire were introduced, harm rather than benefit resulted—due, it was thought probable, to the use of an excessive amount of wire, and to too firm pressure being subsequently applied to the sac.

Closely following the second and third operation with wire, came a

¹ British Medical Journal, 1885.

² Pacific Medical and Surgical Journal, February, 1887, abstracted in the Medical News, March 5, 1887. This operation was performed after Loreta's method, the aneurism being exposed through an abdominal section.

³ Lancet, February 27, 1886.

⁴ Stimson's Reference Handbook, vol. i.

⁵ British Medical Journal, 1872, vol. i.

⁶ British Medical Journal, November 20, 1886.

⁷ Medical News, May 29, 1886.

⁸ Lancet, April 19, 1887.

⁹ Lancet, April 19, 1887.

modification of Moore's method by Levis—that of the introduction of horsehair instead of wire. Subsequently catgut was used by Murray, of Newcastle, and Florence silk by Schrötter, of Vienna. It was supposed that with these substances a nidus for deposit of fibrin would be offered with less risk of subsequent irritation, and with a better opportunity for contraction of organized thrombi and sac wall. It is not easy now to form an estimation as to the exact utility of these agents so used as methods of cure, based on the earlier operations, done as they were before the days of clean surgery. There can be little doubt that the ill result attending several of these was due, as in Moore's case, largely to septic complications. However this may be, the results with horsehair, silk, and gut have not been so encouraging, under like conditions, as those with wire, and this may be due to the fact that material of this sort can scarcely offer so suitable a framework as wire for the formation and support of coagula. It is not easy to fill a sac of some dimensions with such material as silk or gut, which is far more likely than the stiffer wire to be deflected to one side in its introduction by loose coagula present in more or less amount in all cases of old aneurism, so that its equal distribution about the sac is difficult or impossible. For this reason, if coagulation does not at once occur about it, less obstruction would be offered to the flow of blood in the sac, and thus an important factor in cure be lacking. But it is not for these reasons that I would advocate the superiority of wire. Despite the proved occasional utility of horsehair and silk, as in the cases of Bryant and Schrötter, in both of which firm laminated coagula engaged these substances, indicating that coagulation had been favored by their presence in the respective sacs; despite the innocuousness of such material when introduced with the strictest antisepsis, and its susceptibility of admitting of the utmost contraction of clot and sac wall without danger of subsequent irritation, it is not to be preferred to wire for the reason that all the objections which have been urged against the latter may be obviated by the use of a fine and but moderately drawn silver wire, which will permit compression into quite as small a bulk as horsehair or gut, with as little risk of subsequent irritation, and which, in addition, possesses the extraordinary advantage that a method can be conjoined with it whereby certain and prompt fibrin-formation will be promoted in the sac cavity. When it is considered that in many of the cases in which wire was used without electrolysis, especially the earlier ones—which were, of course, done without attention to antisepsis—far more wire was employed than was essential or harmless,¹ and that in many the operation was undertaken as a forlorn hope, the results obtained indicate that the method is not without

¹ In Murray's case, twenty-four feet; in Cayley's, at first forty feet, subsequently thirty-five feet; in Hulke's, thirty-three feet; in White and Gould's, thirty-two feet.

utility. When practised in a manner that experience has taught us is free from risk and most likely to be beneficial, and then, also, combined with electrolysis, by aid of which firm coagulation in the sac can surely be effected, it would appear a most promising mode of treating aortic aneurism not yielding to the Tufnell method or to potassium iodide. With the anode as the active pole, the coagulum produced by galvanopuncture is much firmer than that which forms about unelectrified smooth wire; yet even with many needles in an ordinary-sized sac, as Barwell¹ points out, several trifling nodules of fibrin occurring at the periphery of the sac can have little effect on a large mass of circulating blood. With the combined method the chief objection to the use of a limited amount of fine aseptic wire disappears. Instead of a soft, unstable coagulum about the wire, tardy in appearing, there may be produced almost immediately a tough clot, which, in favorable cases, should tend by accretion to produce prompt obliteration of the sac cavity.

But seven cases of the combined operation are reported; these, with my own, the eighth, are as follows:

CASE I.—Burrelli's (Corradi's).² Male, aged forty-three years; large aneurism of the ascending part of the aortic arch, non-responsive to carefully applied and varied medical treatment, or to the endermic application of electricity (method of Vizioli-Gallozzi). Case not thought propitious for any treatment, as sac-wall was much thinned, communicating opening large, and tumor rapidly growing. A consultation resulted in the adoption of a method of treatment proposed by Corradi;³ the latter inserted a cannulated needle (diameter 8 mm.) into the aneurism in the second intercostal space, in direction almost horizontal from left to right and from before backward, penetrating the sac a distance of 2 cm.; 42 cm. (17 inches) of No. 30 annealed wire were passed. During its introduction the needle was circumducted with the object of winding the wire into coils on its entrance into the sac. The needle was then withdrawn and the extremity of the wire outside the aneurism connected with the anode of a galvanic battery of sixteen elements, tested by a voltmeter to yield 1 c.c. of hydrogen gas for the first minute. Cathode to chest-wall. Current passed for twenty-five minutes. At the end of the first fifteen minutes of its application all pulsations had disappeared except that communicated from the adjacent part of the aorta. Operation was well borne. Pain entirely gone at end of third day. Patient continued to do well for a time, but subsequently all symptoms returned. Death at end of three and a quarter months.⁴ No necropsy.

CASE II.—Barwell's.⁵ Male, aged thirty-nine years; luetic history. Very large progressive aneurism of the ascending and transverse part of the aortic

¹ British Medical Journal, June 5, 1888.

² *Lo Sperimentale*, April, 1879, p. 445 et seq.; and also *Giorn. Internaz. della Sci. Med.*, 1881, p. 1109 et seq.

³ To Corradi is due the credit of first proposing the combination of galvanism with introduced wire, and of treating a case by the combined method. Barwell later, apparently unaware of Corradi's case, suggested a treatment on similar lines, though with a much superior technique to the latter.

⁴ It is interesting to note that this case was reported cured in *Lo Sperimentale*, twenty-five days after the operation. The subsequent account of it is briefly given in a paper by Maracchi in *Giorn. Internaz. della Sci. Med.*, 1881, p. 1109 et seq.

⁵ Barwell. Loc. cit

arch; advanced pressure symptoms; medical treatment of no avail. When almost at the point of death, ten feet of the finest steel wire, which had been spirally wound, were passed through an ivory needle into one division of the sac. Anode active pole; cathode upon upper dorsal region; ten milliamperes passed for one and one-sixth hours. Redness of skin produced at site of negative pole; no irritation at point of puncture. Signs of consolidation appeared at expiration of twelve hours: pulsation more distant; tumor firmer; pressure symptoms much diminished. On the fourth day after operation rapid increase in size of a secondary sac to the right of the former. Death on the seventh day from exhaustion and rupture of the secondary sac. Necropsy showed pronounced pressure effects on lungs. Primary sac contained much thick, firm, decolorized fibrin intimately united to sac and wire.

CASE III.—Roosevelt's.¹ Male, aged twenty-five years; luetic history. "Aggravated aortic aneurism threatening death," involving upper four ribs on the right of sternum. Despite medical treatment, rapid advancement. Through a short, insulated aspirator-needle 225 feet of fine steel piano-wire (No. 00) were passed, connected with "one pole of constant battery," which not stated; the other over right shoulder. "About twenty-five milliamperes were passed for a half-hour." Potassium iodide (begun before operation) continued. Tumor pulsated less strongly the second day; pain and vertigo present. Third day, tumor less painful, but still pulsated; breathing "not so comfortable." Fourth day, dyspnoea and cyanosis. Seventh day, less pain and cyanosis; in better condition than before operation. During the third week could swallow and breathe with greater ease; tumor felt firmer. In fourth week vomiting and headache; potassium iodide discontinued. On twenty-second day "painful dark-colored spot appeared on one toe." Death on the twenty-third day. Necropsy not permitted.

CASE IV.—Abbe's.² Male, aged forty-six years; no lues. Rapidly advancing aneurism at root of neck; oval cavity four inches by five inches; medical treatment unavailing; ligation of carotid, and shoulder amputation decided against. Case adjudged utterly hopeless. Barwell's operation resorted to for the purpose of lengthening life and to lessen pain; 100 feet of No. 1 aseptic catgut were introduced a few days before the wire, following which a part of the tumor seemed firmer, but rapid advancement occurred in other portions, with pronounced pressure symptoms. On the ninth day following the use of catgut, 150 feet of fine sterilized wire were introduced through insulated aspirator-needle. Anode at first the active pole; cathode to back; fifty milliamperes for one half-hour; one hundred milliamperes second half-hour, cathode active pole, anode to back. No pain; pulsation continued, though tumor wall firmer. On second day rupture of the sac into trachea; pronounced pressure symptoms on trachea had long preceded rupture. Necropsy not permitted.

CASE V.—Kerr's.³ Male, aged thirty-eight years; luetic history. *Fusiform* aneurism from the base of heart to origin of left subclavian artery. Pressure symptoms. Medical treatment continued three months without result. Six feet of drawn silver wire were introduced through medium-sized hypodermic needle insulated with shellac. Anode the active pole, cathode to epigastrium; current passed fifty minutes, its strength or the number of cells employed not stated. Impossible to force cut end of wire into sac through canula; canula therefore withdrawn; wire cut close to skin and forced in. Pain and pulsation stated to have been greatly relieved, though death occurred on the eighteenth day. Necropsy revealed fusiform aneurism as above. Wire had entered anterior surface of the sac. About the wire, as well as on the sac-wall, a firm clot had formed.

CASE VI.—Kerr's.⁴ Male, aged fifty-six years. "Aortic intra-pericardial aneurism," forming pulsating tumors on the right of sternum extending from the second to the fourth intercostal space. Pressure symptoms. No

¹ Medical News, April 9, 1887.

² Medical News, April 9, 1887.

³ Occidental Medical Times, January, 1889.

⁴ Loc. cit.

improvement from medical treatment. Electrolysis tried: two insulated needles in sac, anode active, negative on epigastrium; current passed for one hour. No improvement followed. Electrolysis through wire then used, *modus operandi* as above; ten feet of drawn silver wire were introduced; current passed for a half-hour, its strength or number of cells not stated. Within two months the patient left hospital "feeling as well as ever." Promised to report should symptoms return; no word at date of publication of paper.¹

CASE VII.—Rosenstein's.² Obese young male, aged twenty-five years. Venereal and alcoholic excesses. Aneurism of the ascending part of the aortic arch, unimproved by the Tufnel-Balfour treatment. Pronounced pressure symptoms. Galvano-puncture tried; single needle; anode active; seventy milliamperes for twenty minutes. Thirteen days later this procedure was repeated with two needles. No improvement. Five and a half weeks later, through exploratory trocar for six minutes a slowly increasing current up to seventy milliamperes was passed; lance of trocar removed and two and one-sixth feet of spirally wound, moderately thick, softened silver wire, such as is used in trachelorrhaphy (about No. 28), were passed through the canula. The wire was pushed entirely into the sac with the lance, and the current applied for thirty minutes. Pain subsided in a few days; breathing became easier; tumor grew gradually smaller and harder, and the pulsation less. Pulsations had disappeared in the seventh week, complete recovery following.³

The history of my case, not before published, involving a number of points of interest, is related somewhat in detail.

CASE VIII.—F. D. F., American, white male, of spare build, height about five feet seven inches; best weight about 140 pounds; occupation, insurance agent. First seen in July, 1888, then aged thirty years. About two years prior to this date pain had developed in the back in consequence of attempting to carry a heavy load. Lumbar pain thus induced, though slight at first, became severe after three or four days, and so continued steadily for about a month. Subsequently pain was chiefly localized in the left lumbar region anteriorly and posteriorly. Besides a dull, more or less continuous ache, there were lancinating pains in the area of distribution of the upper lumbar nerves. Several months before he was first seen, at a time when the pains were very slight or were absent, he indulged in violent wrestling, an exercise of which he was fond. Immediately afterward, while seated, he felt something give way in the former painful area. Shortly subsequent to this a small pulsating tumor appeared in the upper part of the left lumbar region. There was no history of lues. He was a trifle given to excessive venery, but was otherwise temperate. The bowels were much constipated. Examination revealed a small, expansile, pulsating swelling to

¹ Dr. Kerr informs me by letter that he lost sight of this patient about one year following the operation, and that all later inquiries regarding him have been fruitless.

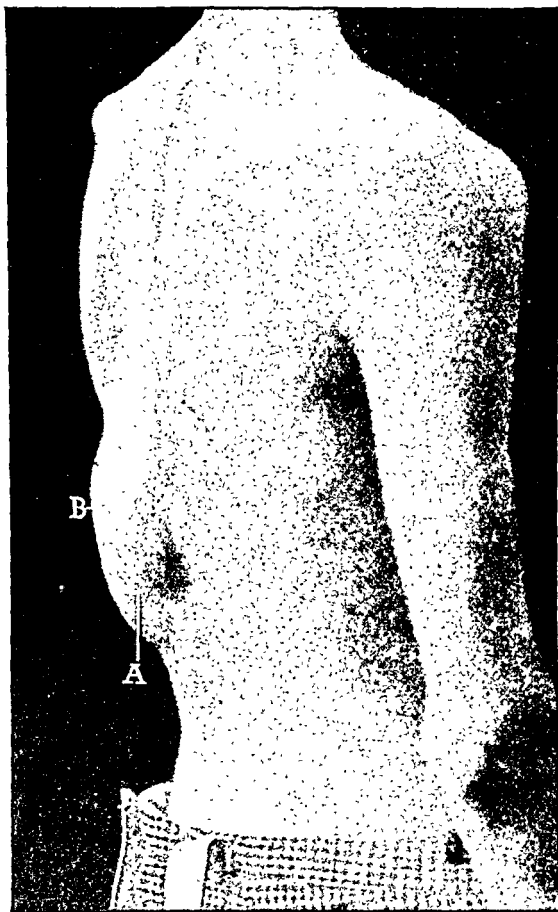
² THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, January, 1891.

³ Under date of February 15, 1892, two years following the operation, Dr. Rosenstein informs me that his patient has continued cured. That he has had "no return of symptoms, except that in March last, after a comparatively mild though prolonged indulgence in *Baccho*, there was a slight irregularity of the pulse and a very faint bruit. Energetic measures as to total abstinence, more rest, and a little potassium iodide with digitalis, helped him in about three months, and he has remained well ever since."

the left of the upper left lumbar vertebræ. Over it the second sound of the heart was plainly distinguishable, but no murmur. The latter was present somewhat above, at the border of the twelfth rib. There was no pulsation or murmur to be heard anteriorly. The heart was overacting, but otherwise normal. No difference could be detected in the femoral pulses. Aneurism of the abdominal aorta was diagnosed, and the patient received into the wards of the Jefferson Hospital. He was put at rest in recumbency on a spare diet, after the method of Tufnell. Potassium iodide was prescribed at first in doses of gr. x., three times daily, and subsequently in larger amount. The bowels were moved daily by laxatives, and codeine ordered in moderate doses for the relief of pain. The patient could be persuaded to keep at rest only with difficulty, and after a three months' sojourn in the ward, during which the pain much ameliorated and for a time disappeared, though no marked alteration occurred in the aneurism, he left the hospital. As it was thought that rest in recumbency rather than potassium iodide had benefited him, barium chloride was prescribed three weeks before his departure, at first in doses of one-tenth of a grain, and after a few days one-sixth of a grain, with seemingly remarkable benefit in the symptoms. Under this drug (other conditions as before), pain—which, despite every care taken to improve his condition, began to be as severe as formerly—now almost disappeared, and the area of aneurismal impulse somewhat diminished. He could not be persuaded to continue longer in the hospital, as his means were limited, and he felt sufficiently improved to continue his work. He was not seen again until seven months later (May, 1889). He then stated there had been little or no constant pain in the interval, and that he had been able to continue his work without interruption. During this period he had taken the barium chloride in doses of from one-sixth to one-third of a grain. The tumor had not increased in size. In the erect posture the impulse was slight, detectable only by palpation; in recumbency, prone, it was perceptible to the eye, but not nearly so extended as at first, and its sounds were more distant, indicating that partial solidification had occurred. The heart was somewhat irritable, with a relatively accentuated apical second sound. The pulse was: standing, 100; sitting, 96. The bowels, as before, were unmoved without purgatives. Barium chloride was now increased to one-half grain doses.

I subsequently saw him but four times up to October 26th: once in June and three times in October. During this period, contrary to my advice, he actively pursued his vocation, which necessitated a great deal of walking. When seen in the autumn the improvement had ceased to be maintained. Without my knowledge or advice he had increased the dose of barium chloride to three-fourths of a grain a month before I saw him, on October 17th. The area of bulging and impulse was then larger, and the heart was very irritable. Barium was now discontinued. He consented to rest for a few weeks, and pursue the Tufnell treatment; but, after a short time spent in bed, he returned to work, and was not seen again until September last. He then had been confined to the house for two months, being too much prostrated and the pain too severe to go about. During the interval of two years in which I had not seen him he had taken little or no care of himself. His physical condition had grown progressively worse. Despite this, he continued his employment quite steadily until within a few months of

September. More or less gnawing pain was felt in the region of the aneurism, with paroxysmal attacks of left-sided abdominal pain. The bulging posteriorly had reached a length of five and a half inches; its greatest breadth four and a half inches. There were three large nodules upon it, far more prominent than are shown in the photograph.



A. Site and direction of entrance of canula through which wire was introduced.

B. Site and direction of entrance of second needle.

Bulging began opposite the spinous process of the ninth dorsal vertebra, and extended to the lower lumbar spines. The abdomen and ribs were more prominent on the left side, which measured from mid-spine to mid-sternum one and three-fourths inches in excess of the right side. A marked impulse was perceptible to the eye and by palpation in all parts of the aneurism, the walls of which seemed thin and but ill-protected by clot. A murmur was heard over the most prominent portions. No sounds were detected laterally or in front over the prominent left abdomen. The area of splenic dulness was considerably increased. The heart was irritable, its sounds high-pitched, the first lacking in muscular element: the impulse was slightly lowered and displaced to

the left. There was a markedly accentuated pulmonary second sound, without any sign of an obstructive cardiac affection. The pulse was somewhat irregular and compressible. There were also cough, mucopurulent expectoration, and some dyspnœa. Mucous râles were present in the upper part of both lungs, accompanied by diminished resonance on percussion at the left apex. There was an area of anæsthesia extending over the aneurism from about the ninth dorsal spine above and the second lumbar below laterally and anteriorly toward the median line, in a direction slightly downward. Above and below this there was intensely heightened tactile and pain sense, the slightest touch or firm pressure causing much suffering. The superficial reflexes of dorsum, chest, and abdomen on the left side were extraordinarily heightened, very trifling stimulation producing markedly increased response on the same and the opposite side. The right knee-jerk was +, the left + +. Ankle clonus was absent. There was no paraplegia. The pain felt in the back was quite constant, lasting for hours, and was gnawing in character. Excruciatingly severe pain was felt in the left hypochondrium, loin, and abdomen. To relieve this he had been taking codeine in the extraordinary doses of gr. xx. to gr. xxx. daily. This was ordered discontinued, small doses of denarcotized opium at short intervals replacing it. He was removed to St. Mary's Hospital in September.

During his sojourn there his physical condition improved somewhat, but the area of bulging seemed to grow larger almost daily. As the physical signs indicated rapid advancement, and that rupture of the sac was imminent, the performance of electrolysis through introduced wire was suggested to him as offering a chance of at least slightly delaying the fatal issue, and, perhaps, also promoting euthanasia. He was told a cure was now impossible. With this understanding he was anxious for the operation. It was done on December 7th last, with the assistance of Dr. Pottberg, to whose mechanical skill I am indebted for many suggestions of value in the technique. Mr. Otto Flemming, who contributed the electrical outfit and needles, was also present. As my prime object in this case—in which a cure could not be expected—was rather to promote prompt formation of firm protecting coagula, in order to retard rupture of the thin-walled sac, than to cure an aneurism of such dimensions, with symptoms indicating advanced implication of vital parts, I chose a rather heavy silver wire;¹ for, on consideration, I concluded a better chance of immediate success lay in the introduction of wire of sufficient calibre to form large, supporting spirals in the sac, thus occupying considerable of its cavity, and affording a framework for clot, than in the use of a thinner, more pliant wire, which, though better calculated to permit of ultimate contraction of organized fibrin and sac walls—apparently not to be hoped for here—might undergo deflection from its course in introduction through impingement on loose coagula already in the sac, thus perhaps rendering it necessary to repeat the process, which from the patient's enfeebled condition would

¹ "Drawn hard to No. 23 Brown & Sharp gauge." It was so drawn that it would readily form spiral coils. It was afterward kept for several days on a roll two and a half inches in diameter, so that when removed and passed through a canula it assumed separate spirals each of about three to five inches in diameter, a few feet of it covering quite a large area.

have been impracticable. A canulated steel needle, two and a half inches in length, of sufficient size to permit the passage of the wire, insulated with shellac to within half an inch of its point, was used to pass the wire. The wire and needles were sterilized by boiling in carbolated water. The hot water somewhat softened the insulation, which was subsequently hardened in cool air. I feared to use carbolized glycerin to lubricate the needles before introduction, lest this would also disturb the insulation. The use of unsterilized glycerin or oil was considered unsafe because of the danger of sepsis, so the needles were passed after being simply remoistened in water. The canulated needle carrying the wire was inserted to within half an inch of its hilt. A platinum needle was also used, which was passed until it was thought that the insulated part was fully within the sac. I had primarily intended introducing the canulated needle in the upper, most prominent, and apparently the thinnest part of the sac wall, in a downward direction, as nearly as possible parallel with the long axis of the body, hoping in this way to favor coagulation that would protect the exterior wall, but little guarded by clot. Mr. Flemming had made for me four platinum needles of good calibre, two inches in length and insulated to the extent of one inch. These I had also intended introducing below and over the most prominent parts of the sac, in a direction perpendicular to that of the canulated one, connected with the same rheophore, thinking that I might thus be able to secure the formation of multiple coagula extending from the wire to the needles and sac wall, and thus nearly consolidate the sac. Unfortunately for my purpose, it was found impossible to insert the canulated needle above in the direction desired, there still remaining some portions of the ribs yet unabsorbed, which interfered with its introduction. A trial was made in two places, but so much pain and disturbance of the sac was caused by my effort that I desisted, passing the needle below, in an upward direction, with the patient reclining prone.

Two and a half inches of wire were now slowly inserted, the distal end of the wire being first blunted by filing. An effort was now made to introduce the platinum needles. These, however, because of their cutting ends not being spear- or lancet-shaped, could be passed only with the greatest difficulty, the use of oil not being feasible, so that but one of the four was entered. The current was gradually increased through the controller until seventy milliampères were reached, and was maintained at this strength for one hour. The negative (indifferent) electrode was a very large felt plate, which lay upon the right shoulder and scapula, and was kept constantly moist with hot water. Notwithstanding this, and also that its situation was altered as much as space would permit, the large surface covered was the seat of intense pain, so that the current was momentarily opened through the rheostat to place a large folded, thoroughly-wet towel beneath the plate—a method I had before found to be of service when much pain is experienced from the contact of the felt when very strong currents are employed. Pain was unnoticed here after this, and none was experienced at the site of the active pole in either needles or sac. The pulse became quite feeble during the early part of the electrical treatment, but this weakness was not maintained, the patient standing the ordeal well. Considerable difficulty was encountered in withdrawing the needles, due evidently to the firmness of the clot about them. I preferred not to practise a reversal of the current

before their withdrawal, as has been recommended in the electrolysis of aneurism, lest the coagulum forming about the anode be softened by cathodic action. By gentle and continuous rotation and slight traction, with lateral pressure on the sac walls, they were removed, being also aided by an ingenious thought of Dr. Pottberg's, that of taking the lid of a stiff pasteboard pillbox, parting it from its periphery to its centre, and slipping it about the needle's base. Pressure made upon this by the fingers, instead of directly on the sac, enabled more counter-force to be utilized in withdrawal. Before removing the needles an attempt was made to push the portion of wire yet within the canula into the sac. This procedure does not commend itself to my judgment, as it appears that such a method must inevitably disturb the relation obtained by electrolysis between the wire, clot, and sac wall, loosening the coagulum if attached to the sac. But a small portion had been passed in when blood appeared at the canula's extremity, and at the same time the patient stated that he felt something moving within, the first sensation that had been noticed in the sac. The needle was now cautiously withdrawn in the manner stated, the wire cut close to the skin and gently pushed beneath the latter, after drawing the skin as a cover over the wire.¹ During the introduction of the canulated needle blood spurted on the needle entering the sac wall to about the depth of one-third to one-half of an inch, this indicating the extreme thinness of wall, covered by skin, fascia, and muscle, and supposed to be lined by a certain amount of clot. Hemorrhage ceased on passing the wire into the canula. None occurred on withdrawing the needles. Their site of exit was sealed with cotton soaked in iodoform collodion.

The condition of both needles on withdrawal showed unquestionable clot formation about them. Both insulated and uninsulated portions of the platinum one, as far as it had penetrated into the sac cavity, were covered with thick, white, tenacious fibrin, in appearance resembling white paint. The steel canulated one was heavily coated with clot, and its uninsulated portion was partly decomposed, a slight touch on the cutting extremity crumbling it beneath the finger.

A few hours subsequently the sac felt warmer than before, indicating inflammatory reaction, and pulsation seemed much less expansile. Considerable pain was felt in the centre and left side of the abdomen, but no more than had been present before the electrolysis. This was relieved by the passage of flatus and feces. Small doses of morphine and chloral were ordered should the pain become unbearable without their administration, the utmost quiet in recumbency was enjoined, and but little fluid in the shape of drink or food permitted. The patient was very uneasy, as he had been before the operation, though for several days pain was not so severe as formerly, but the same amount of opiate was taken. It was impossible to keep him at rest. He tossed about the bed constantly, and could not be restrained at times from walking about the room. Despite this, a remarkable change was noticed in the condition of the aneurism when the latter was examined on the third day. The prominent pulsating portion through which the canulated needle had been passed had sunken to the level of the general aneurismal surface, and transmitted pulsation alone could be detected in it. The whole of the

¹ The skin had been pushed to one side in introducing the needles in order to form a valve-like opening.

lower part of the sac felt much firmer, and was quite without pulsation, while the extreme upper part seemed to have undergone no change. Yet all parts of the trunk about the sac above and below, laterally and anteriorly, could now be handled lightly and with varying degrees of pressure without the slightest discomfort on the part of the patient, the heightened tactile- and pain-sensibility having entirely disappeared, as had likewise the much-increased superficial reflexes. The tendon reflexes in the legs were not again tested. For several days the pain seemed less. Little, if any, darting pain occurred, but the gnawing sensation was felt deeply in the abdomen, probably due to erosion of vertebræ, and after the fourth or fifth day it became as severe as before. At the end of the ninth day succeeding the operation, immediately after the patient had been tossing himself about on the bed from the prone to the supine position and had been thumping his left side with his fist—a practice he was addicted to when in pain, and which he insisted upon pursuing though aware of its danger—he suddenly called for a cuspidor that he might spit, and almost immediately a gush of blood came from his mouth, and in a few seconds he was dead.

A necropsy was made eight hours succeeding death. Body had been placed in dorsal position; it was still warm. Blood oozed from the mouth when turned upon the side. The former aneurismal bulging had disappeared. On opening the abdomen the sac was not discernible without displacing the stomach and intestines. On removal of the sternum the left lung appeared collapsed. The anterior surface of the left pleural cavity was filled with fluid and clotted blood. The right lung was normally distended with air. Pleural adhesions existed on both sides above, laterally, and posteriorly. The pericardium contained a normal amount of fluid. The heart was one and a half times the size of the closed fist. Left ventricle especially hypertrophied. The valves were normal. The ascending and transverse aorta was slightly dilated saccularly, and the seat of extensive atheromatous degeneration. The spleen was six inches in length, five inches in width, and one and a half inches in thickness. Its anterior surface was adherent to the capsule of the left lobe of the liver, two and a half inches of which extended across a good part of the spleen. The anterior and posterior upper margins of the spleen and about one-half of the upper posterior portion were intimately bound to the aneurism, which lay above it and tended to push the spleen downward and forward.

The sac extended from a point about opposite the right nipple obliquely downward and to the left, across the bodies of the ninth, tenth, and eleventh dorsal vertebræ to the lower edge of the twelfth rib on the left, filling the hypochondrium and a part of the lumbar region. It was twelve inches in its oblique measurement, four inches in transverse diameter above on the right, and six inches below on the left. The aneurism had arisen from the posterior and left lateral wall of the lower thoracic aorta, and subsequently had involved a portion of the abdominal aorta. It had advanced beneath the base of the left lung, and thence downward, the diaphragm forming a partial covering. The anterior wall of the aorta was plainly discernible crossing the sac, the orifice of which measured two inches in length. An effort was made to remove the sac entire without disturbance of its contents, and the left lung with it, into which rupture had occurred. This was found to be impossible without mutilation of the exterior of the body, forbidden by

the relatives. The boundaries of the aneurism, including, as they did, vertebræ and the greater portion of the posterior part of the right trunk, prevented the enucleation of the thin-walled sac without coincident removal of these structures. The sac was, therefore opened *in situ*. It was yet distended with about a quart of clot and some fluid blood. The site of rupture—a one and a half inch tear—was in the upper left portion, the rip extending into the base of the lung, and thence upward toward the posterior part of the apex of the superior lobe and through the visceral pleura. The wire lay in coils in the sac. The highest portion of the most superficial coil was about two and a half inches below the point of rupture. The distal extremity of the wire lay in the same situation, its point curved somewhat away from the ruptured portion of the sac. The wire was adherent below to the sac wall, but whether by clot or through its proximal portion not having completely entered the sac, I could not discover, as when an effort was made to ascertain this the wire and coagula had become loosened in the cavity through a second attempt being made to remove the sac. Firm clots existed in all portions of the aneurism, with softened ones evidently of very recent origin. The wire was engaged in several large, firm clots which were of so solid a texture that when examined in that part of the sac which was removed they could be separated from sac and wire only with some difficulty.

The bodies of the lower dorsal vertebræ were much eroded, the spinal cord, protected only by its membranes and thin laminated fibrin, lying exposed in the sac. These vertebræ formed part of the sac wall, as did also the inner surface of the posterior and lateral portions of the inferior ribs on the left. These ribs, in parts, had almost entirely disappeared. All portions of the periphery of the sac contained more or less white, laminated coagulum, some of which had undergone organization. The rent in the sac extended through laminated clot and sac wall into the base of the lung, ploughing for itself a sinus of some size. The calibre of the greater portion of the transverse colon and all its descending portion were much narrowed. The other abdominal viscera were normal. There were cretaceous nodules at the apex of the left lung.

Although these cases were treated by a similar method, a glance at the histories indicates that their character is so diverse as regards susceptibility of cure, and the application of the method so varied, that it is impossible to draw deductions from the results as a whole as to the utility of the procedure. The latter can only be arrived at by individual survey of each.

The cases of Corradi (Burresi's), Barwell, Roosevelt, and Abbé were apparently hopeless prior to operation, as was my own. In these, more than decided amelioration in the symptoms could not be expected. In the first case of Kerr's, that of fusiform aortic aneurism, this treatment could, of course, be of slight avail. In the remaining two cases, those of Kerr and Rosenstein, the results were decidedly beneficial, in the latter's absolutely curative; in Kerr's the patient was lost sight of, but not until subjective symptoms had entirely disappeared. The fact that

he promised to return should the symptoms recrudescence, tends at least to indicate that this case has also remained well.

In Corradi's case the chances of cure by any method were most remote. The decided temporary benefit following the operation, indicating prompt clot-formation, shows, however, the possibilities of this procedure, which, as practised by Corradi, was faulty in the small quantity of wire used, and in the fact that the wire was not spirally wound before introduction.

In Barwell's case, despite its unfavorable nature, undoubted signs of consolidation in the sac resulted, a fatal issue being due to rupture of a second sac into which the wire was not passed. The presence of firm decolorized fibrin adherent to the wire and sac illustrated the beneficial effects of the electrolysis. Although a current of much greater strength than ten milliamperes would probably have been still more productive of good, the final result would have been, of course, similar.

In the case of Roosevelt the amount of wire used—two hundred and twenty-five feet—was probably much in excess of that necessary to fill the sac with coils and sufficient to interfere with subsequent contraction of the aneurism, had the case been susceptible of cure by this method. In Abbe's case one hundred feet of catgut had been introduced nine days prior to the insertion of one hundred and fifty feet of fine steel wire, a quantity greater than could be attended with the best ultimate results had a cure been within the range of probabilities. Here, too, the method was faulty, in that the polarity of the current was reversed after fifty milliamperes had been passed by the anode for a half-hour; the effect of one hundred milliamperes through the negative pole for the same time subsequently, probably being to soften and partly dissolve the firm coagulum formed about the positive pole.

In these four cases fine steel wire was used. In Kerr's cases and in Rosenstein's and my own case, silver wire was employed. Kerr used ten feet of silver wire of a calibre somewhat greater than the bore of a medium-sized hypodermatic needle which it was drawn to fit. Rosenstein used two and one-sixth feet of softened silver wire. In my case, two and one-half feet of drawn wire of rather large calibre were inserted.

As the immediate cause of death in a number of cases in which filiform material was used has been rupture of the sac, it is important to inquire as to the influence of introduced substances, and especially wire, in its production. Rupture may follow the insertion of filiform material of any sort, in consequence of the partial obliteration of the sac cavity by formed coagula resulting in rapidly raised pressure on an unprotected and weakened portion of the sac now exposed to a greater pressure than formerly. This was probably the cause of rupture in Barwell's case and my own, as well as in those of Domville, Ransohoff,

and others,¹ in which a necropsy showed that no wire lay near the site of rupture. With the use of too firm a wire, or of wire in too great quantity, rupture is especially to be feared as a result of its interfering mechanically with contraction of fibrin and sac wall, and tending by its resistance to weaken a part of the latter. If steel wire be used, an additional danger may lie in the likelihood of its fracture in several places during contraction of the consolidated aneurism. The sharp extremities of these broken portions might be productive of great damage to the sac wall. Rupture apparently is only likely from the direct action of the wire when unyielding material, such as steel or highly-drawn silver, is used, or when an excessive amount of wire of any sort is introduced. Therefore, while it is important that the wire used should be sufficiently firm to be readily introduced, it must, on the contrary, not have so much permanent spring as to resist contraction of the clot of which it must necessarily form a part. Soft iron wire has been especially recommended by Steavenson,² as best fulfilling the various indications. He suggests that during the passage of the current soft iron wire would undergo decomposition, with the formation of chloride and oxide of iron, which would in addition exercise their own specific coagulating property. I was at first much inclined to the use of soft iron wire in preference to wire of other metals, until I undertook some experiments as to the influence of currents on the former, the result of which has caused me to prefer a wire less likely to be decomposed by the battery. In passing a current of fifty milliampères for one hour's time through ten feet of No. 36 soft iron wire, connected with the positive pole, and placed in twenty ounces of three-quarter per cent. salt solution, the circuit closed by the cathode in the fluid but not in contact with the anodal wire, an amount of detritus resulted, representing iron chloride and oxide, from the decomposition that had occurred between the wire and the solution under the influence of the current, that would be dangerous to release in an aneurismal sac. A portion of it would, of course, become engaged in the forming clot; another portion, however, might readily be carried into the circulation, and provoke the formation of thrombi elsewhere. A current of much less strength had a proportionately similar effect; that of ten milliampères for the same time also caused the formation of much sediment. Since it is of the utmost importance that a firm thrombus be promptly formed about the wire, and as this is more likely to result through the passage of a strong current for a considerable time, such as fifty to seventy milliampères for one hour, and since this strength

¹ In these, coagula forming about the wire had not completely filled the sac. In my case the sac was of such dimensions that the spirals did not reach much beyond the upper half, the wire having been introduced from below, and but two and one-half feet having been used.

² *Lancet*, July 11, 1887.

of current for this time, carefully applied, is attended with no more risk than a less strength for a briefer time, it is important that the ampère be high and the session long. But this would be attended with the above-mentioned danger if soft iron wire were used, and as steel is also objectionable for the reason before stated, wire of another metal, such as silver, is to be preferred. Silver salts will not be formed under the current's influence in appreciable quantity, and yet the wire will be sufficiently corroded to favor the deposit of fibrin upon it. The wire should be fine, and should be drawn just sufficiently hard to be readily passed through the canula forming spirals in the sac of about the size desired.¹ The cases apparently in which the best results were obtained, both when wire alone was used and when reënforced by galvanism, were those in which ten feet or less of wire were introduced.²

As Kerr remarks, six to ten feet are sufficient to introduce into any aortic aneurism, the object being merely to favor deposition of fibrin, and at the same time to provide a supporting matrix for the clot. As a means of demonstrating that but little wire is essential, he suggests the passage into a bottle the size of the aneurism, through a perforated cork, of sufficient wire to fill it with loops. It then will be seen how few feet are necessary to come into contact with all parts of the bottle's interior. He believes, also, that when a greater amount than ten feet is employed there is danger of the excess passing away in loops into other portions of the vessel, or, when the sac is in juxtaposition to the heart, of its entering the ventricle.

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THE RELATION OF MICRO-ORGANISMS TO THE DISEASED ENDOMETRIUM.

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THE following are the results of some experiments made by myself in Koch's laboratory in 1887-88, and heretofore unpublished, upon the pathology of the endometrium. I was at that time engaged upon

¹ Kerr (loc. cit.) directs that the calibre of the wire selected be somewhat larger than the diameter of the canula, and that it be drawn through a plate until it develops spring enough not to "kink." It must not, however, be overdrawn, as in such a case it will not coil away from the point of the canula, but will impinge on the opposite wall of the sac, as was the case in a third patient upon whom Kerr attempted the introduction of wire.

² Loretta's case, practically cured when death occurred, ten feet; Morse's case, cured, four and a half feet; Kerr's case, thought to be a cure, ten feet; Rosenstein's case, cured, two and one-sixth feet.

solving the problem of causing mercurial solutions to retain their virtue and preventing the formation of a precipitate in the presence of albuminoid substances. Having prepared and described that which has since been known as the acid sublimate—that is, the combination of sublimate with an acid (say tartaric, citric, or any other), whereby these above-named objections were met—a direct application of this was essayed upon patients in the various clinics in Berlin.¹ Among the many experiments made were attempts at disinfecting the endometrium. Of course, I had to find out what was to be destroyed in the way of living germs in order to establish the action of the antiseptic. It was in this way that I was led to investigate the conditions of the endometrium in its relations to microorganisms. In order to have a more accurate notion, I examined the scrapings from the uterus of six healthy women. This was done with the sterilized platinum loop and brought into twelve tubes, six containing peptonized bouillon and six glycerin-gelatin. The latter were used for pouring plates. The same experiment was repeated in each of the six cases, with the following result:

The loop was passed through the length of the uterus to the fundus, scraping the mucous membrane, and then brought out; this was then introduced into the respective tubes. The bouillon tubes were placed in the incubator, and became turbid with the development of microorganisms on the second day, in each instance. The gelatin plates developed an average of twelve colonies of bacteria each, which, on examination with the microscope, proved to be mostly the various streptococci of suppuration. There were, however, a few colonies the identity of which could not be easily recognized, and consequently transplantations of these were made into fresh bouillon tubes, and after two days' incubation a series of three guinea-pigs was inoculated with them. One of the colonies was of a whitish, mother-of-pearl appearance, with dentated edges, and singly these organisms presented the appearance of bacilli, about the same length, but much thicker than the tubercle bacillus. The guinea-pigs inoculated with ten drops of the fluid culture of these germs died within from five to seven days, without any special external manifestations. Their autopsy showed invariably the presence of the same organism in the blood, and the liver and kidneys were enlarged and fatty, showing that they had succumbed to a rather severe form of septicæmia. For convenience sake we will call this microorganism *x*. A second organism not recognizable was one that presented very small colonies, perfectly white, and which soon liquefied the gelatin. On microscopical examination these colonies were found to consist of micrococci. Bouillon pure cultures were made from these colonies and three guinea-pigs inoculated with ten drops of this culture. In two instances these animals died of a form of pleuro-pneumonia in from four to six days. The third pig did not suffer from the inoculation. This unnamed organism we will call *y*.

A third colony, the identity of which I could not recognize, presented a grayish appearance, with a troubled surface; it was also found to be a micrococcus. Upon injecting bouillon cultures of it in guinea-pigs

¹ Berliner med. Woch., 1887, No. 54.

the animals presented no reaction whatever. This organism we will designate as *z*.

As a result of this group of experiments, we see that in the healthy endometrium are present numerous organisms, pretty much the same as would be found in the nose, and their presence might be accounted for by their travelling from the pudendum into the vagina. The normal secretions of the uterus seem to retain them indefinitely. They seem to do no more actual harm there than do the hundreds that inhabit the saliva. They are kept at a respectful distance from the bloodvessels by the mucus, and, *not developing*, do not exert any irritation; in a word, they exist quite superficially.

I then, through the courtesy of Dr. Fehleisen, procured specimens of secretions from women with endocervicitis.

Using the platinum loop in precisely the same way that we did above, and inoculating the same number of bouillon tubes, we found that the liquid was troubled but a few hours after inoculation, while the gelatin plate in each instance developed an enormous amount of colonies—say between three hundred and four hundred—remembering that we apparently took the same quantity as in the case of the healthy patient.

In the plate cultures we recognized vast numbers of streptococci pyogenes aureus, albus, and citreus, a few bacilli pyocyaneus, and also many of our unnamed colonies which we had found in the healthy patient and which we designated above as *x*, *y*, and *z*. It happened that in these cases we did not find the gonococcus of Neisser. All that it was our power to observe was the difference in the number of colonies to each plate and the presence of the bacillus pyocyaneus, which we had not found in the case of the healthy women.

After having carefully cleansed the parts with warm water and removed as much of the secretion as possible, the experiment was repeated, scraping the mucous membrane with the platinum loop. The result varied but slightly, eighteen plates thus prepared showing an average of two hundred colonies each.

From the above experiments it seems that when the mucous membrane of the cervix is inflamed the microorganisms normally present exist in much vaster quantity. Here we might ask ourselves whether they exist as cause or effect. But we prefer to postpone the consideration of this point. Prof. Martin furnished me, at his clinic, with the scrapings from six different patients whom he had curetted for chronic endometritis. In two cases there were pieces of diseased tissue of a size sufficient to be imbedded in celloidin, and sections were made. These were found to consist of a mass of fibrous tissue, corresponding to what Martin has styled "interstitial endometritis," but which we know to be simply the expression of a slow and chronic form of inflammation. The glandular elements seemed compressed and diminished in size and calibre, the mass of the specimen appearing to consist of closely organized fibres. Here and there a few spindle-shaped cells and still fewer young round

cells. Staining these sections by Gram's method, we distinguished in the depths of this tissue the presence of streptococci here and there.

Some sections presented more of the so-called glandular form of endometritis; that is, the epithelial lining of the glandular acini was greatly hyperplastic, forming in some places arborescent excrescences, the surface of which consisted of cells disintegrated and disintegrating. In these but little fibrous tissue was to be found, and we concluded that the inflammation was of a more superficial character and acute in nature. Here throughout the inflamed area could be distinguished vast numbers of microorganisms. I would not weary the reader with a further detailed histological description, but say simply that in both forms were present in the tissues themselves, microorganisms of apparently the same nature as had been found heretofore, but now imbedded in epithelial cells of various shapes and even in the deeper fibrous tissue of interstitial endometritis. The identity of the various microorganisms was proved by particles of this tissue being placed in glycerin gelatin and poured plates, which developed no colonies which we had not recognized before. Though the colonies were plentiful (50-100), I cannot lay any stress upon this point, inasmuch as it was impossible for me to compare the particle of scraping with the apparently corresponding amount of fluid taken up in the platinum loop. Three cases of women having gonorrhœa were examined. The same quantity of secretion was examined. Plates developed 200 to 300 colonies, but no gonococci, as they do not develop on gelatin. Microscopically, the secretions contained large numbers of micrococci and gonococci. Scrapings from the uterus showed the presence of the gonococcus throughout the degenerating epithelial cells.

From the above experiments we gather that—

1. The normal endometrium of uterus and cervix is a harbor for vast numbers of microorganisms, most of which are known to us, but some still unknown but possessing poisonous qualities for guinea-pigs.

2. The inflamed endometrium contains the same kinds of microorganisms, but in vaster quantities, the superficial exfoliating cells also containing them.

3. In chronic endometritis the secretions contain about as many infectious organisms, the mucous membrane and fibrous tissue become greatly hypertrophied under the continued development of these organisms, and whether this chronic condition be simple or gonorrhœal, we find the germs both in the epithelium and fibrous tissue.

It now becomes necessary to explain how these organisms get to the deeper parts, and explain how far their relation as a *cause* of the inflammation extends.

It is plain that the mere presence of the microorganisms does not suffice to constitute disease. Disease is the reaction upon the system

—local or general, or both—resulting from the *developing* organism. In the uterus the normal secretions are a *poor* culture medium for germ life, and at the same time keep the microorganisms at a distance from the bloodvessels. If given the proper opportunity, however, if furnished with blood or serum retained any undue length of time within the uterine cavity, microorganisms develop therein with as remarkable rapidity as they do upon artificial culture media in the laboratory. Now the conditions will have changed, and enormous hordes of bacteria soon develop from those already present, and infect the tissues. In our observation, judging from the reaction of tissues under the influence of developing bacteria elsewhere, we would say that cold is, perhaps, the most frequent cause of the initial process; the congestion which soon follows the action of cold upon the tissues being familiar to us all. Next follows the exudation of serum, which is soon contaminated by the bacteria in the neighborhood; these finding their most favorable soil develop rapidly, producing a chemical irritant or ptomaine which is the decomposition of the serum incident to their growth; this acts as a direct chemical irritant which keeps up indefinitely the irritated condition of congestion and hence hypernutrition of superficial cells, proliferation of cells resulting, which cells naturally find their protoplasm inoculated from the first with the bacteria under whose impulse they developed.

In the chronic form with hyperplasia of fibrous tissue, there occurs to me no explanation but that the original infection took place as above described, and that, either from neglect or other causes, the parts have become so irritated that the deeper fibrous tissue, under constant congestion, became infiltrated with white blood corpuscles by diapedesis, which gradually built new fibrous tissue, dovetailing with that already existing.

Simply from a histological and pathological standpoint, inasmuch as the foundation of treatment in disease is the removal of the cause, finding that these microorganisms exist nearly always to a certain depth, cutting is the rational treatment—removal of all the diseased cells through which we could not expect an antiseptic to act. Thorough scraping being done, it but remains to so sterilize the regenerating mucous membrane as to leave it uncontaminated. Here the acid sublimate solution finds a happy application in the strength of from 1 : 2000 to 1 : 5000. At the end of a few days the uterus replenishes itself with a new mucous surface.

MULTIPLE SARCOMATA. HISTORY OF A CASE SHOWING MODIFICATION AND AMELIORATION OF SYMPTOMS UNDER LARGE DOSES OF ARSENIC.

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THE following are the chief points of interest, in giving the subjoined history, or rather histories, of this interesting case.

1. The very large dosage of arsenical solutions.
2. The extreme tolerance of them by the individual.
3. Their well-marked beneficial effect upon the growth and the individual.
4. The complete or almost complete subsidence of the tumors at various times while the treatment was under way, and their ready recurrence on suspension of same.
5. The relative obstinacy of the growths situated on the neck and head to treatment.
6. The evident delay of the ultimate lethal issue, in spite of the recalcitrancy of the patient.
7. That the treatment instituted was original in character, the author at the time of its commencement not being acquainted with the writings and experiments of Köbner and others in the same direction.

The patient, Mr. G. S. H., aged thirty-nine years, native of United States, medium height, fairly well-built and nourished, of somewhat nervous and anxious expression, was first seen by me at my office toward the end of February, 1888. He had at the time a large indolently ulcerating tumor situated on the posterior portion of the left thigh, the lower portion involving the upper part of the popliteal space; he claimed that it had its origin in irritation caused by an uneven and broken high stool, upon which he had been accustomed to sit at his duties as a clerk in an office; it first commenced as an indurated lump with inflamed border, then began to ulcerate, about four months previous to his first visit, and had become as I now saw it. He dated his earliest noted symptoms back to about a year from the date of visit. Recognizing an interesting and probably malignant trouble, I treated him a few days with placebos and cleansing applications. The New York Dermatological Society meeting of February, 1888, occurring a short time after, I presented him there for diagnosis and discussion on his case, which is reported briefly, in the April number of that year, in the *Journal for Cutaneous and Venereal Diseases*, under the heading of "The Society's Proceedings." It was regarded as malignant by most of those present, my own opinion being that it was sarcomatous.

Ablation was recommended by almost all. He would not submit to this, and refused even to have a small piece taken out for microscopical examination.

The tumor grew rapidly larger, while the patient still deprecated any operative measures, although strongly urged, until, the indications of its malignity becoming evident even to himself, he at last yielded, and on April 15, 1888, at his own house, I removed the whole of the tumor and surroundings down to the fascia, by a nearly circular incision, the wound measuring four and a quarter inches in diameter, the tumor itself at the time measuring three and a quarter inches in diameter, so that the zone of slightly involved tissue was well included; the wound was cauterized with chromic acid and allowed to heal by granulation. Portions of the tumor extending from the free margin to the centre were examined by Drs. G. T. Elliott, A. R. Robinson, the President of the Brooklyn Microscopical Society, and myself, all coming to the same conclusion, that it was undoubtedly sarcomatous.

The progress of healing of the wound being necessarily slow, he was allowed to leave for the country (New Hampshire, his home) at the end of May; he remained away a little over a month, returning at the end of that time with still a small open sore. During this month's absence another small button-shaped and quickly ulcerating tumor had appeared on the right thigh just below Poupart's ligament, which he absolutely refused to let me excise or take other radical means to remove. He still remained inattentive as regards visits, although he said he would try any medicine, and begged for it. Later on, in the course of three months, a large number of other tumors appeared in various regions of the body; on both nates, sides of chest, over the shoulder, on the arms, were quite large ones, all of which developed more rapidly than the first in the femoral region, with which they were uniform in general appearance and mode of progression, save that there was greatly increased rapidity of development everywhere.

I had given no internal treatment to speak of up to this time, except for a short time at the end of February and beginning of March, when I tried an active course of mixed treatment which seemed to hasten ulceration, and was consequently stopped.

The same requests, as at first, for instant operation for ablation of the growths met with the same fight for delay, so that it was not until he became hopeless of any improvement without that course, that he finally consented, and on October 7, 1888, he entered Brooklyn Hospital, as my private patient, I being then on service, for a course of entirely radical treatment.

I operated on him on that day, he being under anæsthesia about two hours. I removed the tumor in the femoral region (it measured two inches in diameter) by excision; six other large ones, none being less in diameter than a silver dollar; and a number of smaller ones, about thirty in all, I extirpated partly by excision, partly by *raclage* with sharp dermal curette; cauterizing all with chromic acid around edges of wounds, and thereafter using bandages and dressings of simple cerate. I had previously resolved to test the effect of arsenic in full doses, and in a cumulative way, having a distinct belief that it would favorably affect his condition, but must own that I was surprised at the evident beneficial effect in a relatively short time. I put him, then, about thirty-six hours after the operation, on a mixture of four parts of Fowler's to one of Donovan's solutions, to commence with eight-drop doses of the mixture four times a day, adding daily at least one drop to each dose, sometimes more, until I had him taking twenty-six to thirty

drops four times a day; about that time he would usually, and sometimes before he reached that limit, show an amount of constitutional reaction, which though not as extreme as might be thought, would be sufficiently marked to show the danger limit, and the stomach would give out a little, so that it would become imperative to suspend the remedy for awhile, and give the stomach rest for a day or two, never longer, beginning immediately again with about ten-drop doses.

Many of the small tumors, half-pea sized, or even larger, which I had not curetted, disappeared in a very few days, not more than a fortnight or at most three weeks after instituting this constitutional treatment; all infiltration of the edges and areola dying away where there had been infiltration around other tumors, and on the former sites of these small tumors an atrophied spot could be felt, such as occurs in morphœa or in scleroderma after subsidence of the acute lesion. He did steadily well, became able to attend to business in some measure, and in December 1888, I first took him to my friend, Dr. A. R. Robinson, who had previously been in consultation with me just before his reception into Brooklyn Hospital, for a thorough examination, and subsequently took him to the December Session of the New York Dermatological Society, when I placed him in evidence as a valuable, not to say wonderful, illustration of what arsenic can do in modifying this form of kakoplastic embryonal fibrous tissue. He then, with my permission, took cars for his native place to pass Christmas and New Year, with precise orders how to take his remedies, when to leave them off, and with most distinct and solemn promises on his part to keep me well posted as to his progress, etc. I heard thereafter *once* or *twice* from him at disconnected times; he evidently fell under influences that were not favorable, with one exception, that of Dr. S——, a practitioner of the town in which he lived, who used his best efforts to keep him in line, but failed; so that from this time I may be said to have lost control of the case.

When I next heard of him he was in the hands of Dr. John B. Wheeler, of the College and Mary Fletcher Hospital, Burlington, Vt., who kindly furnished the following complementary history:

"When Mr. H. first came under my care, February 15, 1889, he was covered with the sarcomatous growths with which you are familiar. They varied in size from one-eighth inch to two and a half inches in diameter. He was in a condition of extreme exhaustion, excessively hyperæsthetic, so that he could hardly bear a touch without screaming, sleeping with great difficulty, and almost devoid of appetite. Under these circumstances I thought it best not to begin the arsenic treatment which he said had had a very good effect on the growths but a very bad one on him, and I therefore put him on quinine, stimulants, and morphine, with the intention of building him up and of removing the growths as fast as I could. This treatment was continued until May 1st. During this time I operated on him four times, at intervals of two or three weeks, and removed in all one hundred and seventy tumors. They were cut out with scissors and the raw surfaces thoroughly burned with the Paquelin cautery. Careful antisepsis was observed, but after granulation began the raw surfaces were dressed with balsam of Peru. Microscopical examination of the growths removed showed a structure fairly typical of sarcoma. Recurrence took place faster than it was possible to operate, and the only advantage afforded by operation was

that the growths were removed when they were small. No recurrence, however, ever took place in a cicatrix, except on the scalp, where the skin surrounding the growths had become much more infiltrated than elsewhere. Everywhere else the wounds granulated well and cicatrized quite promptly, the new growths all appearing in the sound skin.

"On May 1, 1889, as the sarcomata were multiplying rapidly and the patient had got into a very fair condition of general health, I began to give him the same mixture which I believe you used, one part of Donovan's solution and four parts of Fowler's. The dose was at first ten drops, t. i. d., but as soon as I found he bore that without trouble, the dose was increased one drop every day. He stood this very well until doses from eighteen to twenty-five drops were reached (sometimes I could get him up to twenty-five, sometimes not above eighteen) when his appetite disappeared, his eyelids swelled, and he became nauseated, and very nervous and hyperæsthetic. The dose was then cut down to ten drops, when he would become all right again, whereupon the dose was again gradually increased to the limit of tolerance. He took his arsenic in this way as long as he was under my care, raising and lowering the dose according to indications, and also took from one and a half to six ounces of whiskey, and from $\frac{1}{2}$ gr. to 1 gr. of morphine daily most of the time.

"In about four weeks it became evident that no new growths were appearing, and that those which had grown since the last operation (some thirty in number, some of them one inch in diameter and badly ulcerated) were less angry looking and were diminishing in size. By the end of June, *not the faintest sign of a malignant growth was left*¹ on the man (except the cicatrices showing where the growths had been), saving some half-dozen on the face and scalp, which for some reason (great vascularity of skin of those parts?) seemed to resist the arsenic with uncommon obstinacy.

"By the 20th of July, the patient had become so thoroughly poisoned with arsenic, swelled eyelids, loss of appetite, strength, nervousness, hyperæsthesia, and despondency (no diarrhœa) that I became alarmed and stopped his arsenic for ten days, at the end of this time his general health had improved greatly, but a dozen new sarcomata had appeared on trunk and extremities.

"The arsenic was resumed July 30th, in the same way as before. For about a week the sarcomata enlarged until some reached one inch in diameter, then they became less inflamed and diminished in size. No others appeared.

"By August 22d several of the growths had disappeared and the remaining ones were steadily diminishing. At this time the patient became very desirous to go to his home in New Hampshire, and as he was in fair condition and apparently able to stand the journey, I consented to his departure, which he took on that day. My only news from him since then is a short note written by his physician the day after reaching home, which informed me that Mr. H. had stood the journey well."

The exact date of his demise I do not now remember, but his friends informed me that it was about the end of December of that year, it being

¹ Underlined in original.

due apparently to neglect of remedies, recurrence, and consequent exhaustion.

In regard to what I have termed, at the commencement of this paper, the points of interest in this case:

First. While there may be records of larger therapeutic doses used than those here given, the time element also being considered, none such have come under my notice in my readings. The daily amount of arsenious acid was, as will be noticed, about a grain a day at times. As regards the mixture, which will be remembered as being four parts of Fowler's and one of Donovan's solutions respectively, I may say that I added the latter solution, not for its specific mercurial effect, but as an additional and effective absorbent or resolvent agent.

No doubt as to correctness of diagnosis is probable—the high grade of examiners renders that impossible; but should such doubt exist, the balance of the larger tumor is still in alcohol in my possession, and is at the service of anyone interested in the subject.

Second. The tolerance, as was evident, was exceedingly marked, and the very rapid disappearance of toxic symptoms on cessation of the remedy was peculiarly so; in a couple of days, ordinarily, all such symptoms, gastric or other, would entirely disappear. This, however, I do not think unusual, as a good many patients suffering from psoriasis whom I have treated at some time by arsenic in the course of their disease, have shown the same ready disappearance of bad effects.

Third. It is now scarcely necessary to say anything as to the effect upon the individual or the tumors; as to the latter the history speaks, but as to individual it may be further said that while he was under observation the fairly large doses (not those near the toxic mark) seemed to benefit and improve nutrition and strength.

Fourth. The subsidence of the tumors on taking the remedy has also been sufficiently dwelt on in the histories, but it would seem important to call attention once more to the fact of their extremely rapid recurrence on disuse of the remedies; this was very marked, and seemed to be very like a problem in arithmetical progression; the more tumors present, the more rapidly would others develop in other parts, and the more readily would ulceration in the larger ones begin and continue.

Fifth. The relative regional obstinacy in regard to treatment. This was noted by Dr. Wheeler particularly, and though not so specially noted in my history, was observed by myself. To particularize: At the time of operation in the hospital, I purposely left one growth on the neck, above the collar, in order to better observe its conduct while under constitutional treatment: precisely that one, and one or two others on the scalp, were the slowest to respond, persisting after others had entirely disappeared. I have noted this fact before, and in an article read before the American Dermatological Association, "Remarks on, and

Queries as to, the Relative Frequency of Pathological Changes in Moles and other Tumors on the Face and Head," which was published in the *Journal of Cutaneous and Genito-urinary Diseases*, January, 1887, I use the following words: "There are many other parts of the body, it would seem, equally or more exposed to these accidents than the carefully guarded face; as for instance the hands, nates, waist, and neck; the two latter from constant friction of clothing and other causes. Moles and other small tumors are sufficiently common on all parts of the body, but it would appear by the statistics given, and by other experiences of the writer, that the ratio of further and destructive pathological activity is much less in them (that is in all other parts of the body) than on the head and face." Further: "The most rational way of solution or accounting for the frequency of these growths on the site mentioned is probably that it is after all due to the extent, nature, and abundance of circulatory nutrition, which must favor hyperplasia in these well-supplied parts," etc.

Sixth. Delay of lethal effects of the disease I shall not dwell upon; it was certainly evident to all having any close connection with the case.

Seventh. As has been stated, though it may read as a confession of carelessness on his part, the author at the time of inception of constitutional treatment was ignorant of the records of recent experiment of others in the same direction. He had, however, been long convinced of the inhibitive efficiency of the drug in other malignant affections, notably epithelioma, and has been very lately additionally confirmed in this by many cases, among which may be cited a recent and marked one of genital epithelioma; a secondary operation having been done, followed by a third, to remove immensely involved inguinal glands and tissue. The operation was brilliantly and radically performed by one of New York's leading surgeons; but all the consulting medical men (at least five in number, including myself) decided it was impossible, or almost so, for recurrence not to rapidly take place, and the patient was by general verdict given anywhere between three and six months to live. This occurred about a year since. Arsenical treatment, at my suggestion, has been since employed. The individual is now living and enjoying better health apparently than for some years previous. This conservative result, I believe, has been largely due to the result of this constitutional treatment.

Dr. H. Köbner's writings and cases came under my observation some months after inception of my treatment, but since that had acted so well, I did not feel like "changing horses while crossing a stream," and persevered with internal medication.

It will be noted that Dr. Köbner gave his arsenic hypodermatically, which doubtless has its advantages, but also its disadvantages, as causing slight wounds and points of irritation.

I do not see why the conjoined treatment, internal and hypodermatic, might not be used with greater benefit than either alone, or at least so, where rapid results seem necessary.

His papers will be found in the *Berliner klin. Wochenschrift*, 1883, page 21, under the title of "Heilung eines Falles von allgemeinen Sarcomatose der Haut durch subcutane Arseninjection." Also, in 1886 (*ibid.*, p. 193), there is report of a case shown at a meeting of the Berlin Medical Society, under the heading "Vorstellung eines Falles von multiplen Hautsarkomen der Extremitäten."

Dr. Funk, of Warsaw, in the *Monatshefte f. prakt. Dermatologie*, 1889, viii., page 19, publishes an exhaustive article under the title of "Klinische Studien über Sarkome der Haut," giving histories of cases of his own in which he had followed Köbner's plan of treatment, and a general *résumé* of the subject and writings thereupon. The article would serve as a bibliographical index. He recommends, as does Köbner, the injection of a recent solution of arsenite of soda, as being on the whole the best.

As I have before said, the union of the internal and hypodermatic methods would, however, in my opinion, seem to offer the best future therapy.

REVIEWS.

RECENT WORKS ON DISEASES OF THE NERVOUS SYSTEM.

THE DIAGNOSIS OF DISEASES OF THE NERVOUS SYSTEM: A MANUAL FOR STUDENTS AND PRACTITIONERS. By CHRISTIAN A. HERTER, M.D. New York and London: G. P. Putnam's Sons, 1892.

A MANUAL OF DISEASES OF THE NERVOUS SYSTEM. By W. R. GOWERS, M.D., F.R.C.P., F.R.S. Second edition, revised and enlarged. Vol. I.: Diseases of the Nerves and Spinal Cord. With one hundred and eighty illustrations, including three hundred and seventy figures. Philadelphia: P. Blakiston, Son & Co., 1892.

DR. HERTER'S book is happily free from the sketchiness and incompleteness that characterize Dr. Ormerod's little treatise, recently under review. It is, in fact, one of the most notable productions of the American press in neurology in recent years, from its admirable mastery of details and its broad grasp of the general subject. It is, of course, merely a restatement of the well-recognized facts of neuro-pathology, but it is a good one. Such a book deals necessarily with the results obtained by other men. Not the author, but the great body of diligent workers everywhere have established the facts and laid down the principles that make such books possible. Hence, for the reviewer, especially if he seeks for novel and original results, there is not much to say about the book, except to acknowledge cordially its general excellence, and to commend it as a useful implement in the clinical workshop. With the aid of such books the daily work of the average practitioner is not only helped, but even made possible. Their essentials are accuracy and clearness, and these qualities Dr. Herter's book has to an unusual degree. It is lacking, to a remarkable extent, in bibliographical references—in fact, there are almost none. This must be an omission, as no one, not even of the widest clinical experience, could prepare such a digest without frequent references to the writings of his co-laborers in neurology.

In the diagnosis of diseases of the spinal cord Dr. Herter follows closely the conventional standards. For him myelitis and all its subdivisions exist as of old, and he points out faithfully the various symptoms that differentiate them. He says, to be sure, in one place that the question depends much upon our conception of inflammation; but he does not discuss the important questions as to the essential nature of the pathology of the so-called inflammatory, as well as of the degenerative, processes of the cord. This is well, perhaps, in a book that is concerned rather with clinical types than with obscure questions in pathology. There is, however, much reasonable doubt as to the very existence of a true myelitis except as a result of infection. Tubercle—as in Pott's disease—syphilis, and various blood-poisons produce

the type of myelitis about which there can be no debate. But the numerous mixed and *bizarre* cases, either due to trauma or vaguely ascribed to cold, over-exertion, sexual excess, etc., are doubtfully inflammatory; some of them in the past have been certainly cases of neuritis, while most of them are probably due to shock, pressure, injury, vascular disease, or to gliomatous changes of doubtful origin.

This subject of gliomatous changes in the cord, and the malign influences that set them at work, is one of the important questions to-day in neuro-pathology. The French give this morbid process the generic term *gliomatosis*. It is this process that underlies syringomyelia, and, as Déjérine has shown, Friedreich's ataxia also. We have elsewhere pointed out the probably close connection and confusion of these two so-called diseases. Griffith's statistics of Friedreich's disease prove incontrovertibly that at least twenty-five per cent. of the autopsies show the anatomical changes ascribed peculiarly to syringomyelia—*i. e.*, extensive gliomatosis with cavities in the cord. A recent case observed by the writer revealed diffuse gliomatosis of the cord, medulla, and cerebellum; the clinical type had been that of brain-tumor. All this bears very directly upon diagnosis, and must in time modify the accepted clinical distinctions. As Dr. Herter's book deals mostly with elementary topics, he has probably thought it best to avoid these unsettled problems. Yet we think it would have been appropriate to discuss them, even in a treatise on diagnosis—because diagnosis, after all, is the recognition of disease processes rather than the elaboration of clinical types.

Dr. Herter has a very methodical plan. He first discusses the structure and functions of the nervous system, then symptomatology, then localization, then pathology, then clinical types, and finally the distinction of functional and organic disease. Special chapters are given to the examination of the patient and to cases illustrative of diagnosis. Thus, the scope of the book is broad, and the treatment is thorough. We should like to see the authorities for some of the statements; as, for instance, that ophthalmic migraine is followed not rarely by general paresis, and that the athetoid movements persist during sleep. But whatever hasty statements this useful book may contain can be corrected in the second edition, which, doubtless, will be required in time.

GOWERS's book is too well known to need commendation and too thoroughly elaborated to invite brief criticism. The work, indeed, when complete in its second edition, will be quite encyclopædic, and far ahead in this respect of any similar treatise by one author in any language. We cannot help but think, however, that the style is needlessly diffuse. The extent of the additions may be judged by the fact that one hundred and fifty pages have been added to this first volume alone. Every part has been rewritten or retouched and brought apparently up to date. We shall refer here to a few of those chapters only in which new and debatable subjects are discussed, in order to show how our author regards some of the live questions in neurology. The chapter on multiple neuritis has been entirely recast and much enlarged. Five classes of the disease are recognized: (1) Toxic, due to a known poison in the blood, as lead, arsenic, and alcohol. (2) Toxæmic, due to some unknown virus, which is probably an organism or its chemical product, as leprosy, septicæmia, diphtheria, typhoid fever, syphilis, etc. (3) Endemic, as malaria and beri-beri. (4) Rheumatic, following exposure to cold, and

probably due also to a morbid blood-state. (5) Cachectic and senile, due to malnutrition, arterial degeneration, etc. As is seen, this classification is somewhat artificial, but it illustrates the ascendancy in the author's mind of the microbic pathology. All these groups except the last are apparently regarded as specific—there is no longer an idiopathic neuritis, just as there is no effect without a cause. This is a scientific approach to the humoral pathology. It is of great interest to note this influence on the author's mind in his purely theoretical explanation of the effects of "cold" in the so-called "rheumatic" cases, both of neuritis and of myelitis. He presupposes a morbid blood-state as the cause of the inflammation. He instances rheumatic fever, due to a similar exposure to cold, and which he thinks must depend in some way upon "the disturbing influence of the chill on the chemical or other processes within the body." Pneumonia and chorea are produced by this obscure, rheumatic, vito-chemical "humor," whatever it is, and polyneuritis, also, is among its manifestations. Finally, phthisis, which sometimes complicates multiple neuritis, is supposed to have some dependence upon the implication of the vagus—an opinion that will please the advocates of the nervous origin of phthisis. In the more practical clinical and pathological descriptions this chapter is complete to the most minute details.

The peroneal type of muscular atrophy, described by Tooth in 1886, is fully discussed in an almost entirely new section. This chronic persistent atrophy begins, as is well known, in early life, usually in the extremities, and presents features that define it sharply from other varieties of atrophy. These are symptoms of nerve-involvement, such as anæsthesia and the reactions of degeneration. The atrophy is likely to follow acute specific diseases, such as measles, and to occur in several members of the same family. Gowers believes it depends upon a slowly progressive peripheral neuritis, as has actually been found by Friedreich and by Gombault. He also thinks that there may be a congenital tendency to premature failure of nutrition in the peripheral nerve-fibres, like that which, in the pyramidal fibres, underlies hereditary ataxia. Autopsy in one case failed to show changes in the cord, but the nerves, unfortunately, were not examined.

Gowers finds that Morvan's disease is a form of syringomyelia, to which is added a peripheral neuritis; upon this neuritis the peculiar anæsthetic whitlow depends. Charcot has recently taken a somewhat similar view of this affection.

In his chapter on "Traumatic Lesions of the Cord," the author does not take a judicial position, which the question in its present state demands as well of the physician as of the court. He speaks rather slightly of the "experts" for the railway companies, and refers by the authors' names to most of the recent papers on the subject as being "more or less instructive." His own writing on the subject, however, is to us among the least instructive. He makes the broadest possible allowance for all the subjective symptoms of so-called "spinal irritation" and "railway spine," and apparently gives the utmost credence to the tales of litigants. On the other hand, he makes no allowance for the malingering that undoubtedly complicates this important subject; in fact, he does not even mention it. The cases of organic disease, such as he cites, are easy of diagnosis and seldom, if ever, come to trial. It is the case of the "neurotic" victim, whose suffering is assuaged with a

verdict, that demands for its consideration the finest judgment and conscience of the physician. We get no light on this subject from Dr. Gowers.

New sections on "Beri-beri," "Brachial Neuritis," and "Senile Paraplegia" are worthy of note. Altogether, the second edition of this valuable treatise confirms its position as the standard book on its special subject in the language.

J. H. L.

A TEXT-BOOK OF THE PRACTICE OF MEDICINE FOR THE USE OF STUDENTS AND PRACTITIONERS. By R. C. M. PAGE, M.D. New York: William Wood & Co., 1892.

THE general plan of this work is that usual in text-books designed for the use of the student. The different systems are taken up *seriatim*, and the acute and chronic general diseases are treated of as classes.

The circulatory system is the first to be considered. In this section, there are but few comments to be made, save in that portion devoted to aortic insufficiency. This valvular lesion is ranked as the least dangerous to life. With this proposition we cannot agree as to either length of years or the usefulness of the sufferer. The liability to fatty degeneration of the myocardium, to secondary mitral insufficiency, with its attendant symptoms, and to sudden death upon slight exciting causes, would cause us to place it as the lesion rather with the worst prognosis than with the least unfavorable. The author explains the liability to sudden death in cases of this disease by pressure of the enlarged left ventricle upon the coronary arteries. This explanation seems to us to be unnecessarily far-fetched when we have so potent a cause for this disaster in the failure of the aortic valve-leaflets to prevent the back-flow of the blood in the arterial system into the weakened and dilated left ventricle.

In reading the description of pneumonia one is struck by two points: one is the failure of the author to mention the delirium that is often the most prominent and misleading symptom in a case of this disease, and the other, his hearty condemnation of the use of bloodletting, aconite, and veratrum viride. He recommends the employment of tincture of digitalis in doses of three drops every three or four hours—an amount that seems to us to be too small to answer any useful purpose whatever.

The author emphasizes one point that is too often forgotten by or unknown to the general practitioner—the absolute fallacy of declaring pulmonary tuberculosis to be absent merely from the absence of the characteristic bacillus from the sputum in the early stages before breaking-down of lung-tissue has occurred. In writing of the treatment of phthisis pulmonalis the author makes no mention of the plan of treatment now generally known as the Shurly-Gibbes method, the only statement that would lead one to suppose that he had ever heard of the method being contained in the following sentence:

"Dr. J. Blake White, of this city, however, claims that his solution of chloride of gold hypodermically injected gives equally good results in many cases as Koch's tuberculin." With such results as are reported from the *complete* use of the Shurly-Gibbes method of treating pulmon-

ary tuberculosis it would seem that at least mention of the details of the use of their remedies should be made.

In the section devoted to pleurisy it is refreshing to find that the author has not adopted the present popular view of supposing that that disease is necessarily of tubercular origin in the majority of cases. In regard to the treatment of this disease the author makes no mention of the use of salicylate of sodium. This seems peculiar, inasmuch as such good results from its use are being now reported from all parts of the world, and inasmuch as the author himself states his belief that pleurisy may be due to exposure to wet and cold, although he does not directly speak of the rheumatic poison as capable of causing the lesion under consideration. In the matter of the treatment of empyema our author is rather conservative in his views as to the necessity for more extreme measures than aspiration. It will hardly be accepted as strictly true that "In the case of children aspiration alone is necessary." He recommends aspirations repeated at intervals of every five days or a week, if the fluid reaccumulate after the first tapping. In the present state of our knowledge it would seem to be a safer plan to recommend an earlier operation by the knife in case of reaccumulation, even in children. In the case of adults permanent drainage by incision and insertion of a rubber tube are advised; and, although more properly belonging to a work upon surgery, the author might have dilated somewhat upon the frequent necessity for resection of portions of one or more ribs to allow of the amount of collapse of the chest-wall necessary for the closure of the cavity.

The section devoted to diseases of the liver is probably the best in the book, being well arranged, clearly written, and concise, while not abbreviated.

Under the subject of the treatment of uræmic manifestations, the author states that bleeding is no longer practised. This statement we would deny, as this plan of treatment still holds a deservedly high place in the opinion of many able physicians, and has certainly in innumerable cases been the means of prolonging or saving life. In the treatment of uræmia he recommends the administration of an eighth to a quarter of a grain of pilocarpine dissolved in five or ten minims of Magendie's solution of morphine, or combined with veratrum viride.

The author apparently does not put much dependence upon the chemical tests for the differential diagnosis of affections of the stomach, as we find no mention of their use; and it may also be remarked in this connection that the subjects of lavage and gavage are not found among the author's methods of treatment.

There are in the section devoted to diseases of the intestines many points wherein the author differs from the views held by probably the majority of physicians at the present day. Intestinal antiseptics is not considered, in his opinion, to be of much value. In cases of suspected pus-formation in connection with disease about the head of the colon, the aspirating needle is advised as a means of diagnosis. The unnecessary risk of this procedure where pus is not found, its inutility as a means of treatment when pus is found, and the comparatively slight risk of the more radical method by incision, should have by this time convinced all men that the only course open to us in a case of suspected perityphlitic abscess that resists non-operative measures is free incision, exploration and removal of the appendix or drainage of the cavity, as may be indicated by the findings. In the treatment of diseases about

the cæcum and appendix the author absolutely, and we think unwarrantably, condemns the use of poultices and leeches as useless.

The treatment of peritonitis recommended is that of Professor Alonzo Clark, with large doses of opium. Brief mention of the treatment by salines is made, but only in reference to the pelvic peritonitis seen by the gynecologist. Here also, as in fact in all parts of the book, the use of external means of treatment is rather scoffed at. With this view we cannot agree, for, although doubtless these are often used to the discomfort of the patient without corresponding benefit, yet we often find that such means very frequently give much comfort, and seem to have, at least, some influence in bringing about a cure.

In the matter of treatment of enteric fever the statement is made that under the expectant plan 24 per cent. of the cases die in the New York hospitals. This figure seems very high, and is certainly more so than is the usual hospital mortality under the same plan. The "Brand treatment" is described; but our author has neglected to mention what to us has seemed one of the most important details—the massage during the actual immersion in the bath. For the tympanites of enteric fever the author says that "turpentine internally is worthless, if not dangerous, and externally in the shape of stupes it is disagreeable if not absolutely useless." Our old friend, turpentine, is thus summarily condemned, although for years it has been considered a staunch aid in the hour of our most urgent need. While the use of the rational and successful treatment by cold has conferred positive benefit upon our cases of enteric fever, it has also negatively been of service in allowing us to dispense with many internal remedies that when recklessly or needlessly used doubtless frequently aided the disease in its fatal work. For turpentine, however, we have almost as much respect as for alcohol, but its use requires careful judgment and constant watchfulness.

The diseases of the blood receive a small amount of attention, but one is struck by a few points wherein the author differs from the views usually held. Quinine is strongly urged as *the* remedy in leucocythæmia, iodide of potassium and arsenic being said to be of little or no benefit. Under pernicious anæmia no mention is made of the latter drug as a means of treatment. Why this should be seems unexplainable, as arsenic is the only drug that seems to have any controlling influence whatever over this otherwise absolutely intractable disease.

The section upon nervous diseases closes the volume. It is well elaborated for a text-book of this size, and is calculated to give to the student as much information as he is capable of assimilating in this most complicated special branch of medicine.

While it may seem that the reviewer has found many points upon which to unfavorably criticise this work, it should be stated, in justice to the author, that in such a work there can be no very striking points to discuss whereby the author's work might be favorably judged, therein differing from a work appealing more to the practitioner or specialist. The many good points in the book are such as should be found in *every* student's text-book, and therefore are not mentioned by the reviewer. The points herein enumerated are the exceptions that caught the eye in reading what is in the main a very convenient, thorough, and compact text-book of the practice of medicine.

F. A. P.

APPENDICITE ET PÉRITYPHLITE. By CHARLES TALAMON, Medecin de l'Hôpital Tenon. 248 pages. Paris: Rueff et Cie, 1892.

APPENDICITIS AND PERITYPHLITIS.

THIS little volume, belonging to the Charcot-Debove collection, presents in a clear and accurate form the facts, past and present, connected with the important question of inflammations in the right iliac region. The historical portion is exceedingly interesting, and this interest grows as the developments of science gradually discard old notions of typhlitis and perityphlitis for the actual appendicitis which characterizes the vast majority of these cases. Full credit is given throughout the work to the part taken by American authors in our present knowledge of these conditions. The action of bacteria in abscess formation has been well brought out. Although there is nothing absolutely new in this work, still it presents the most comprehensive and up-to-date exposition of one of the most important subjects in surgical pathology and therapeutics, giving at once the views now held by the best authorities in Europe and America, which would otherwise take much time to gather from monographs. We would heartily advise the perusal of this book by those who believe that this protean affection demands all the judgment and surgical knowledge possible for its successful treatment. E. L.

TRAITEMENT DE PLEURÉSIES PURULENTES. By G. M. DEBOVE et M.

COURTOIS-SUFFIT. 228 pages. Paris: Rueff et Cie, 1892.

THE TREATMENT OF EMPYEMA.

THE present volume belongs to the same series as the preceding. It treats of empyema in three parts: 1st, "Historical," from Hippocrates to Estlander; 2d, "Methods of Operating;" 3d, the "Indications" which would call for the adoption of each particular one of these methods. The first part seems to ignore almost entirely the work done by German, English, and American authors in the progress of our knowledge of this affection. The second part tells us in a concise manner the use of the aspirator, and describes fully Estlander's operation for obliteration of the pleura. The third part is interesting, as it establishes a difference in the operative treatment according as the empyema is found by bacteriological examination to be due to the pneumococcus or to the various streptococci of suppuration. The book is an interesting monograph, which will repay anyone for reading it. E. L.

ON HARE-LIP AND CLEFT PALATE. By WILLIAM ROSE, M.B., B.S. LOND., Professor of Surgery in King's College. London: H. K. Lewis, 1892.

THE author of this book has enjoyed great opportunities for a study of the allied deformities of which it treats, both as an assistant to the late Sir William Fergusson and in his own independent fields of labor.

After an introduction dealing with general considerations, the occurrence of hare-lip and cleft palate in animals, their associated deformities,

etc., we find an excellent chapter on the anatomy and physiology of the normal palate, in which is emphasized a now recognized fact—"the frequent association of inherited mental and nervous weakness with a high arched palate."

The chapter on development is from the pen of Mr. Carless, and is one of the best expositions of the subject with which we are acquainted. After some observations, anatomical and physiological, on hare-lip and cleft palate, the author takes up the operative treatment of hare-lip. In this we find a discussion of the question as to what age constitutes the best period for operation. Mr. Rose says that the immediate operation (within two or three weeks after birth) shows a considerable mortality, while the early operation, which is done in the period from the fourth week to the third month, is entirely safe. In a series of between three hundred and four hundred cases, treated by operation between the fourth and eighth week, not one death happened as an immediate result.

In his operation the author insists on the great importance of separating the lip from the maxillæ. He freshens the edges of the cleft by a modification of the well-known method of Stokes. He sutures first with silver wire, and then obtains a finer approximation with catgut, closing carefully with this latter material both mucous and cutaneous edges.

The article on "Cleft Palate" is of great practical value, and sets forth thoroughly all the details of operation upon, and care, anæsthesia, and after-treatment of these most difficult cases.

It may be truthfully said that this book of Mr. Rose embodies the results of a vast experience, and that it combines scientific accuracy, correct observation, and lucid and practical exposition in a most unusual degree. We cannot pay it a higher compliment than to affirm that is entirely worthy of the reputation of the distinguished professor of surgery in King's College.

J. C. D.

CARDIAC OUTLINES FOR CLINICAL CLERKS AND PRACTITIONERS, AND FIRST PRINCIPLES IN THE PHYSICAL EXAMINATION OF THE HEART FOR THE BEGINNER. BY WILLIAM EWART, M.D. CANTAB., F.R.C.P., Physician to St. George's Hospital, etc. With sixty-two illustrations. 8vo., pp. x., 165. New York and London: G. P. Putnam's Sons, 1892.

SINCE to fully appreciate the histological changes taking place in any organ in a state of disease it is essential that we be familiar with the structure of the organ in health, so is it none the less important to be familiar with the normal anatomical relations of an organ in order to recognize with precision any deviation from those normal relations caused by disease. It is with this idea in view that the author devotes the first portion of his book to a recital of anatomical facts, setting forth the relations of the heart to the surrounding structures and the tracing of the normal cardiac outline upon the surface of the thorax. The author has accompanied each step in the process by a graphic diagram which tends greatly to elucidate the text.

In discussing the method of cardiac percussion the author lays down some familiar, but useful, rules. In this section it is somewhat sur-

prising to note the importance which the author places upon the use of Sansom's pleximeter. While this is probably the best of artificial pleximeters it has never obtained any great favor in this country, notwithstanding the fact that Sansom himself introduced it here several years ago. At that time the Sansom pleximeter was a familiar instrument in our hospitals and dispensaries, but it was soon replaced by the more convenient and equally effective pleximeter—the finger.

In the section on cardiac auscultation the author suggests an extremely simple and very clever code of symbols to illustrate the normal heart-sounds and their pathological variations, which cannot fail to render much easier the recording of clinical histories.

The book as a whole will be found to interest the student and those desirous of definite information, succinctly told, upon a subject so important as that with which the author deals; and it offers many suggestions tending to lighten the task both of the clinical clerk and the clinician for whose use clinical notes may be recorded.

T. G. A.

ON COMMON NEUROSES, OR THE NEUROTIC ELEMENT IN DISEASE AND ITS RATIONAL TREATMENT. Three Lectures delivered before the Harveian Society of London, November–December, 1891. BY JAMES FREDERICK GOODHART, M.D., F.R.C.P. LOND.

DR. GOODHART'S Harveian Lectures are full of good things well said. They are an offering to the immortals (who are always with us) who "betoken the intensity of their neurotic degradation, first by the dismal setting of their visage, and then by the minute and exaggerated description of their woes." He runs lightly over the gamut of all the viscera and evokes from it the varying tones of all the neuroses. He does not escape, as an Englishman never does, from a sense of the obligations and disadvantages imposed upon him by one of their set lectureships, and there is the suspicion of a little self-consciousness about him as though he felt he were talking against time; but his science is practical, his wisdom is clinical, and his pleasantries have that zest about them that each as it passes creates a demand and even a relish for the next before it comes.

Though a clinician were to write with the pen both of men and of angels he could not exhaust the subject of the neurotic element in disease; and yet it is quite possible that he could write too much. The danger is that he sees too much, or thinks he sees. He interprets the cry or pain amiss, and gazes only upon the image which the reality of disease projects upon the sensorium of the unfortunate patient. He may also reverse the natural order of cause and effect, and see in suffering, with its dismal complaints, a substitute rather than a sequence of disease. He certainly would do this if, with Dr. Goodhart, he were to regard floating kidney, with its worst symptoms, as colic, hæmaturia, and prostration, as one of the "common neuroses."

This is the danger. But each reader must find the fault and the remedy for himself—as doubtless he will, if he is wise, more often in practice than in books. In the meantime let him read Dr. Goodhart's lectures, for they are as a breath from the four winds, "to breathe upon these slain that they may live."

J. H. L.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL AND
HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

INSANITY AFTER THE KEELEY "CURE."

DR. R. DEWEY reports that eight patients have come under his care at the State Insane Hospital at Kankakee, who were committed directly after a residence at Dwight. 1. Insanity never occurred until after the Dwight treatment; a cure was effected. 2. Morphine habit; resulted in insanity after the Keeley "home treatment;" not cured of insanity. 3. Alcohol habit; sent to Kankakee Insane Hospital after treatment at Dwight; patient cured of insanity, but still drinks. 4. Alcohol, morphine, and cocaine habits; treated at Dwight, relapsed, was wildly insane; recovered mentally, but still drinks. 5. Alcohol and morphine; sent to insane hospital from Dwight; still in asylum. 6. Alcohol, morphine, and cocaine habits; took Keeley "home treatment;" sent to Kankakee Insane Hospital; not insane before going to Dwight, but received insane; discharged cured. 7. Alcohol case; insanity developed at Dwight while undergoing treatment; still in insane asylum. 8. Alcohol case; insanity developed one month after leaving Dwight; not previously insane; still in insane asylum. In each of these cases insanity resulted from the Dwight treatment. There is no doubt but that well-known tonics are combined with some narcotic and mydriatic drug, probably atropine; as to the presence of gold there is great doubt. The results that have been secured can be attributed to the expectation aroused, the "dosing" with atropine and strychnine, which destroys for a time the appetite for other stimulants or narcotics, and the mental and physical partial paralysis resulting from this treatment.—*The Medical Standard*, 1892, No. 1, p. 4.

TURPENTINE IN TYPHOID FEVER.

H. C. WOOD believes that when, in the convalescence of typhoid fever, the existence of local intestinal symptoms points toward slowness of heal-

ing of the ulcers, turpentine is an invaluable remedy. It is also indicated when there is marked tympanites, with dryness of the tongue, developing in the end of the second week of typhoid fever. The action of turpentine is believed to be a local one upon the ulcerated surface. The terebinthines are slowly absorbed, and, indeed, volatilized at the temperature of the stomach and intestines, and we may readily believe, from the results of laboratory researches, that there is a special relation between the oil of turpentine and the bacillus of typhoid fever (Omelchenko). This practice has been in vogue for more than half a century, and the author believes that it is a good one, and distinctly tends to lessen the severity of the local lesions in enteric fever. The formula recommended is oil of turpentine, 1; glycerin, 4; mucilage of acacia, 6; peppermint water to 32. The dose is one tablespoonful every four hours during the day.—*Therapeutic Gazette*, 1892, No. 6, p. 366.

[This sound practice, based upon intelligent empiricism of half a century ago, has recently received support from the results of laboratory experiments, and is now placed upon a scientific basis; and it is likely to outlast many of the modern methods now so much in vogue.—R. W. W.]

THE TREATMENT OF PERITYPHLITIS.

L. REVILLIOD believes in early medical, but late surgical treatment. He employs leeches, blue ointment with belladonna, small blisters, calomel and opium, either separately or combined. The use of gentle laxatives, not purgatives, of which he is very sparing, as well as of enemata, should secure one gentle passage each day. He allows the patients to choose between poultices or ice-bags, and an immovable dorsal position is insisted upon. Medical treatment has cured almost all of his cases. Of those that went on to suppuration, seven were cured spontaneously or by a later incision. When surgical measures are discussed, "in doubt, refrain."—*Revue Médicale de la Suisse Romande*, 1892, No. 6, p. 373.

A CASE OF STAPHYLOCOCCÆMIA PRIMITIVA TREATED BY INTRA-VEIN INJECTIONS OF QUININE.

DR. VITTORIO STENICO reports a case in which the symptoms resembled those of intermittent fever but of an irregular type. The examinations of the blood for the plasmodium developed the fact of the presence of cocci, mostly united two and two, some, however, being single. On gelatine and in agar-agar the colonies were found to be those of *pyogenes albus* and *aureus*: Inoculation and subsequent cultivation produced the same cocci, establishing the diagnosis given above, with secondary development of broncho-pneumonia. Sterilized intra-venous injections of bichloride of quinine resulted in a speedy cure. Further examination of the blood gave negative results.—*Lo Sperimentale*, 1892, No. 11, p. 208.

• ABORTIVE TREATMENT OF FACIAL ERYSIPELAS.

DR. CH. TALAMON treats this disease by sublimated ethereal spray, taking into consideration the force of the spray, the delicacy of the skin, and the depth to which the disease has infiltrated. The strength of the solution is

one part of corrosive sublimate in one hundred parts of ether. He does not fear the blistering of the skin which may happen; the centre of the area is simply moistened, the edges and the adjacent healthy skin are thoroughly sprayed. After the operation, keep the face covered with continually moistened compresses of boric acid. Should eschars form, it is not advisable to detach them. With this method he believes that the disease can be aborted in many instances, and in others markedly shortened in duration.—*La Médecine Moderne*, 1892, No. 27, p. 429.

THE IMPORTANCE OF HYDROCHLORIC ACID IN THE TREATMENT OF DISEASES OF THE STOMACH.

DRS. N. REICHMANN and S. MINTZ regard the indications for the use of this acid to be—1, anti-fermentative; 2, anti-parasitic; 3, increasing the motor functions; 4—very important—its use in the peptonization of the albuminoids. From their observations they conclude that the treatment by this acid in many cases of diminished secretion of the gastric fluids excites the production of hydrochloric acid.—*Wiener klinische Wochenschrift*, 1892, No. 25, S. 363.

THE TREATMENT OF TUBERCULOSIS.

DR. E. L. SHURLY regards hypodermatic medication to be of the first importance, because the medicine is introduced in its pure state and undergoes no change by contact with the secretions of the stomach or intestines; besides, whatever good it does is in a selective way, and the system may get the full benefit. The substance chosen is not necessarily an animal poison, for results may be obtained by an alkaloid as well as by a colloid; he prefers iodine and chloride of gold and sodium, while admitting that other remedies may be found which will answer the purpose better. Even these are not capable of controlling the septicæmia which occurs in a large class of cases. So far as therapeutic indications are concerned there are two: one, to limit the extension of the disease, and the other to neutralize the septic material that is being generated from hour to hour in the course of the disease. There is great hope that we may achieve something in the treatment of this disease, because many of the pathological changes which take place in the lung are really conservative, constituting Nature's efforts to limit the disease. While he believes that pulmonary phthisis is essentially a local inflammatory affection, yet, general tuberculosis is a primary, general affection, and this distinction must be kept always in mind in order that we may set a true relative value upon therapeutic measures and plans.—*Transactions of the Michigan State Medical Society*, 1892.

HYPODERMATIC INJECTIONS OF CREASOTE AND OF GUAIACOL IN PULMONARY TUBERCULOSIS.

DR. CH. ELOY prefers the hypodermatic method of administering these remedies, because of their rapid absorption, relative tolerance, speedy appearance in the breath and even in the taste. The precautions are: 1, asepsis; 2, a graduated Pravaz syringe; 3, the dorsal thoracic (Vigeneaud and Roux), the spine of the scapula (Dujardin-Beaumetz), the infra-spinous

fossæ (Picot and Monnier), the spinal border of the scapula (Demahis), between the serratus magnus and subscapular (Cassin and Toussaint), second intercostal space (Rosenbach), sides of the abdomen (Schætelig), exterior part of the thigh (Polyak), retro-trochanteric groove (Pignol), or the buttocks (Anghelovici), are the regions recommended; 4, the vehicle is sterilized olive oil, or oil of sweet almonds, or liquid vaseline; 5, the method of operation is the usual one of subcutaneous injection with the addition of light centripetal massage. This treatment is advised, in the proportion of creasote twenty-five, or guaiacol ten per cent. solution, against tuberculosis in every stage, except the third—to state the question fairly, against tissues tuberculizable, not against those tuberculized. Congestion and hæmoptysis, renal lesions and pyrexia are contra-indications, but guaiacol can be used in renal disease, and, associated with eucalyptol, in congestion and hæmoptysis.—*Revue générale de Clinique et de Thérapeutique*, 1892, No. 21, p. 322.

A PLEA FOR THE TREATMENT OF SCROFULA WITH CREASOTE.

JULIUS SOMMERBRODT, having used creasote for tuberculosis for the past five years, believes that in this drug we have a remedy for this condition as well. It can be administered to children, when pure, in milk or wine, and as well in capsules with cod-liver oil (not with balsam of tolu), and a daily dosage of more than fifteen minims is not required. Although he believes this remedy is given in too small doses, fifteen to sixty minims being a sufficient daily dose for an adult, yet the excessive doses have not been dangerous, no fatal cases having been reported.—*Berliner klinische Wochenschrift*, 1892, No. 26, S. 641.

THE ACTION OF DIGITALIN UPON THE PULMONARY CIRCULATION.

M. HEGER has experimented with amorphous digitalin dissolved in water containing a small percentage of alcohol. In a curarized dog the kymograph shows that: 1, the sphere of action of this drug is upon the left heart and the bloodvessels arising therefrom; 2, there is no direct action upon the pulmonary vessels; on the right ventricle there is a comparable effect with the left; 3, practically, so far as one can say from these experiments, digitalin is indicated in cases of cardiac weakness without valvular lesion, or in mitral insufficiency. By relieving stasis in the left ventricle it exercises a depletive influence upon the lung, in this case its action is as a "saignée du poulmon."—*Bulletin de l'Académie Royale de Médecine de Belgique*, 1892, No. 5, p. 399.

THE TREATMENT OF PNEUMONIA.

DR. BOARDMAN REED goes very carefully over the literature of this subject and concludes: 1. That water locally applied, either by wet packs or in the form of baths, after the Brand method, is the most efficient single remedy or therapeutic measure for acute pneumonia. 2. That either veratrum viride or aconite can accomplish more than any other single drug in the first stage, and that the same is true of digitalis in the second stage. 3. That a combination of one of these cardiac sedatives with opium and diaphoretics affords

not only a safe but an eminently successful internal treatment for the first stage of acute pneumonia, being capable of aborting the disease when its administration is begun near the onset and is repeated at short intervals day and night. 4. That venesection, though a most efficient means of treating sthenic forms of pneumonia, and, judiciously employed, considerably more successful than any merely expectant method, is no longer an indispensable resource in managing the disease, since other remedies have been found to accomplish the same results more surely and pleasantly.—*Therapeutic Gazette*, 1892, No. 3, p. 166, and No. 4, p. 228.

THE TREATMENT OF PLEURISY.

M. TRASBOT contributes a very interesting paper to the discussion at the French Academy of Medicine, treating the subject from the standpoint of the veterinarian. He concludes that: 1. The sero-fibrous pleurisy of animals has nothing in common with tuberculosis. 2. Frequently the relation between its development and chilling is indisputable. 3. It is impossible to liken the sero-fibrinous pleurisy of the horse to an eruptive fever or to a cyclic disease. 4. Antiphlogistic medication and derivative applications surely exercise an advantageous action. 5. Thoracentesis can be done without danger to the horse, and constitutes a measure to which we may have recourse before the effusion gives rise to asphyxia.—*L'Abeille Médicale*, 1892, No. 27, p. 209.

ON POSTURE AND ITS INDICATIONS.

DR. T. LAUDER BRUNTON gives some illustrations of the different positions assumed in health and disease and some practical deductions therefrom. In cases where the circulation is weak and syncope is threatened, one can place the head between the knees, the patient being in a sitting position. He illustrates the positions assumed to favor the loss of heat and to guard against it. The physiological explanation for the upright position assumed in dyspnoea, the choice of the right side for patients suffering from cardiac disease, and the necessity for turning feeble persons upon their left side to allow of the escape of gas by way of the œsophagus are all cited and the explanations given.—*Lancet*, 1892, No. 3592, p. 12.

RESULTS OBTAINED BY SUSPENSION IN TABES DORSALIS.

DR. BONJOUR has faithfully recorded his observations made at the Clinic for Internal Medicine at Zurich, eighteen patients having been treated. In *résumé*, suspension has frequently diminished the ataxia, Romberg's symptom, and the pains, if not permanently, at least for some hours and even days. Several patients could walk better after several suspensions. The ocular and bladder symptoms were not improved. Only once did the patellar tendon reflex reappear. Although these improvements are minor ones, yet this could not be regarded as a reason for abandoning the treatment. A careful study of his tabulated cases shows that the general condition improved. On the whole, the report is favorable.—*Revue Médicale de la Suisse Romande*, 1892, No. 6, p. 354.

THE TREATMENT OF CERTAIN CASES OF SUBACUTE CYSTITIS BY RETINOL AND SALOL.

DR. E. DESNOS believes that retinol, a white, oily liquid obtained from colophone [colophony; Resina, U. S. P.] by distillation, possesses antiseptic properties. In this liquid, he dissolves salol in the proportion of 5 to 10 per cent., 6 per cent. being the strength usually selected. He uses this remedy when stronger ones are not well borne, the amount varying from one to eight fluidrachms. The peculiarity of this remedy is that it will remain in the bladder even after six or eight urinations. It has no hæmostatic properties, it presents no danger, and it has produced speedy relief in cases rebellious to other remedies.—*Revue générale de Chirurgie et de Thérapeutique*, 1892, No. 22, p. 339.

HAY ASTHMA.

DR. EDWARD S. BLAIR has treated a girl of ten years, who for one-half of her life had been subject to annual attacks of this disease. Under the use of potassium iodide and grindelia robusta there were slight catarrhal symptoms, but on lying down marked wheezing and dyspnœa. These symptoms were checked entirely by the fluid extract of euphorbia pilulifera [dose not stated], and the relief of these symptoms were followed by a marked increase in flesh and strength.—*Therapeutic Gazette*, 1892, No. 3, p. 156.

THE INFLUENCE OF ANTIPYRETICS IN THE ELIMINATION OF SULPHURIC ETHERS IN THE URINE.

DR. ALBERTO ROVIGHI concludes that antipyrine, acetanilide, phenacetine, and hydrochloride of phenocoll, in doses of twenty to thirty grains daily for two or three days, markedly increase the ethers in the urine; with this increase of combined sulphuric acid there is a diminution of the preformed acid. Antipyrine (dose being equal) produces a smaller increase, while acetanilide or phenocoll produce a more marked modification of the elimination. A few days after these experiments one finds in healthy and in febrile subjects a manifest diminution of the normal sulphuric ethers in the urine, and this is especially marked after acetanilide.—*La Riforma Medica*, 1892, No. 35, p. 711.

THE ACTION OF SALIPYRINE.

DR. RICHARD HITSCHMANN, from a clinical observation, concludes that, as an antipyretic, salipyrine either entirely failed or was not constant in its action. As a remedy for rheumatism, even when the joints first affected improved, other joints were frequently invaded or there were relapses. In influenza the headache and pains in the limbs were improved, but it was not a specific. As an anti-neuralgic he obtained better results with this drug. In these cases a dose of seven to fifteen grains is necessary, and may be repeated at one-quarter to one hour intervals. In one instance ninety grains were administered in ten hours. The unpleasant results are sweating, exanthemata, gastric disturbances, irregularity of pulse, collapse, and dyspnœa. It

is in many cases a useful remedy, but to obtain a certain result large doses are necessary, which are likely to give rise to sweating or digestive symptoms, so that one cannot predict its extensive employment.—*Zeitschrift für Therapie*, 1892, No. 12, S. 91.

SALIPYRINE.

DR. TABERLET has used this remedy for seven months. The results are more decisive than with antipyrine or the salicylates, excepting in neuralgias of malarial origin, where he has had two failures. The remedy can be easily taken, since it is without taste or odor, nor does it disturb the appetite. In his hands it has presented no disadvantages, nor has it affected the hearing. It works promptly and efficiently. It has not been used, however, in acute rheumatic conditions.—*Gazette hebdomadaire de Médecine et de Chirurgie*, 1892, No. 27, p. 318.

ASAPROL.

DR. STACKLER has carefully studied this remedy, which is β -naphthol and monosulphate of calcium, pure and anhydrous, soluble in one and a half parts of distilled water and in about three of alcohol. For general antiseptics solubility is an important quality, but for intestinal remedies, when the stay should be as long as is possible, insolubility is certainly an advantage. In adding the sulphur salt to the naphthol, its antiseptic power is decreased, but in much greater ratio is its poisonous quality lessened. In two cases of influenza treated by this remedy the value of it was well established, the fever and pains disappeared more rapidly than with antipyrine and quinine. It has also been strongly recommended for the different forms of acute rheumatism.—*Bulletin général de Thérapeutique*, 1892, No. 22, p. 497.

PAMBATANOS.

DR. H. BAILLOU has recognized this drug, which has recently excited considerable interest, as the root of the *Calliandra Houstoni* (Nat. Ord., *Leguminosæ*), habitat, Mexico. It is supposed to be tonic, stomachic, and astringent, and has been used with considerable success in many kinds of paroxysmal fevers, especially of benign forms, and in light although sometimes very persistent paludal attacks. The plant does not contain any alkaloids, but a tannin of a very astringent quality, and possessing the peculiar characteristic of early turning red in contact with the air. It is not likely that this remedy can replace cinchona or its alkaloids in treating intermittent and pernicious malarious fevers, but since it can be cultivated on the shores of the Gulf of Mexico, in the Carolinas and Georgia, in case it should prove to be useful, a sufficient supply would always be assured.—*Merck's Bulletin*, 1892, No. 5, p. 252.

KOLA-NUT.

DR. BLANC quotes the opinion of Monnet that kola, through its caffeine (2.348 per cent.) and its theobromine (0.02 per cent.) is a cardiac tonic, accelerating its beats, increasing its dynamic force and regulating its contractions.

In the second stage of its action, as with digitalis, pulsations become broader and less numerous. As a corollary of this action upon the blood-pressure, the diuresis is increased, and thus it can be utilized for the treatment of diseases of the heart that result in dropsy. As an agent that protects against waste, it diminishes the urea that results from the combustion of nitrogenous substances, probably in exercising an especial action upon the nervous system. It is a powerful tonic, useful in anæmia, debilitating chronic diseases, and in convalescence from severe illness. It aids digestion, increases the secretion of the gastric fluids, and acts upon the muscular wall of the stomach. It is also valuable in chronic diarrhœa, in certain cases of sporadic cholera, without, however, a physiological explanation for its action. Huchard has found it of great value in convalescence from epidemic influenza, when there is persistent neurasthenia and muscular weakness. It is valuable as a cerebral tonic in the cases of that condition which is especially that of the *fin de siècle*, cerebral neurasthenia.—*Revue de Thérapeutique Médico-chirurgicale*, 1892, No. 10, p. 272.

[During the use of this remedy, administered to patients convalescing from epidemic influenza, and during the progress of certain pneumonias both fibrinous and catarrhal, it was found that the night dose must be omitted and sometimes the drug abandoned altogether, because of the persistent wakefulness to which it gave rise.—R. W. W.]

HYDRIODIC ACID IN SPECIAL PRACTICE.

DR. J. HOBART EGBERT, in a practice limited to diseases of the eyes, ears, nose, and throat, has obtained good results with this remedy. Although the iodides are very diffusible and are rapidly excreted, yet they are irritant, unstable, and offensive to the taste and the stomach; they frequently cause violent coryza, with soreness of throat and eyes, headache, profuse mucous discharge, and renal irritation. Their protracted use leads to anæmia, emaciation, and general vital depression. He believes that these disadvantages can be reduced to the minimum by use of the syrup of hydriodic acid, which has a pleasant acidulous taste, can be advantageously combined with the vegetable tinctures and syrups, and contains a definite amount of absolute hydriodic acid; that is to say, each fluidrachm contains as much iodide as five grains of the iodide of potassium.—*Notes on New Remedies*, 1892, No. 1, p. 1.

THE ELIMINATION OF CREASOTE BY THE URINE.

IMBERT has found that creasote breaks up in the body and is eliminated in the urine as a guaiacol sulphate and creasote-sulphate of potassium. When injected subcutaneously it is rapidly eliminated in the urine, and in large quantity. So far as the expectoration is concerned, it is eliminated very feebly, and it completely disappears from it before the kidneys have finished their work. He has also determined that the absorption from the rectum is active and rapid, but it makes only a very slight appearance in the expectoration for the first twelve hours after administration, and not at all afterward. By the kidneys, it is almost completely eliminated at the end of twelve hours. In comparing the amount eliminated by the kidneys after subcutaneous in-

jection and that after rectal injection, it does not appear that the former method presents any advantages; on the other hand, in the latter instance more creasote is excreted by the kidneys, and this method is certainly the more practical. However much of the material has been used, the elimination is practically at an end in twelve hours, therefore repeated doses are to be recommended instead of infrequent massive ones, but, however administered, the elimination by the lungs is very slight.—*Bulletin général de Thérapeutique*, 1892, No. 22, p. 491.

THE DÉCOMPOSITION OF SALOL IN THE INTESTINES OF DOGS AFTER REMOVAL OF THE PANCREAS.

M. E. GLEY, being familiar with the conclusions of Lépine, that the appearance of salicylic acid in the urine would give valuable information as to the condition of the pancreatic functions, has investigated the subject in a novel manner. Kobert having determined that naphthalol (salicylic acid and β -naphthol) is decomposed by the ferments which the mucous membrane of the small intestine or cæcum secrete, the question at once arose whether salol (salicylic acid and phenol) might not be decomposed by the same means. The experiments upon two dogs, the pancreas being removed, showed that the reaction of salicylic acid was found in the urine as soon, as energetically, and persistently for almost as long a time as in the urine of a dog kept for control. He also determined the fact that this decomposition of salol does not take place in fasting dogs.—*Comptes-rend. hebdomadaires des Séances de la Société de Biologie*, 1892, No. 14, p. 298.

THE USE OF SALICYLATE OF SODA FOR SPRAINS.

M. LABBÉE, without claiming any priority, spoke briefly at a meeting of the Société de Thérapeutique of the markedly satisfactory result which he had obtained by the use of one drachm of this remedy in twenty-four hours for a tibio-tarsal sprain. The following morning there was no pain, and in four days there was complete cure. His results were equally good in several cases, whether or not the rheumatic or arthritic diathesis was present.—*La Semaine Médicale*, 1892, No. 30, p. 237.

LIGHT AS A THERAPEUTIC AGENT.

DR. A. BARRY BLACKER and MR. R. H. CLARKE have made a study of the methods carried out at the establishment of Dr. Rikli, at Veldes, where chronic diseases are treated by means of light, air, and water-baths, and attention to diet and exercise. Although the treatment as described is rough, primitive, and one might say almost barbarous, yet it affords an opportunity to ascertain the effects of sunlight and sun-heat. Separating the effects of light from heat, they conclude that the actinic rays excite the peripheral nerves, and, in moderation, stimulate nutrition and vitality; in excess, they produce various degrees of superficial injury and reflex irritation of other parts, and ultimately involve the nervous centres. The chemical rays of certain intensity cause a deposit of black or yellow pigment in exposed parts as a protection from injurious effects, and this protection must be very important to the

organism, as considerable penalties are incurred in order to secure it. These considerations suggest that the more or less prolonged application of bright sunlight, and possibly of electric light also, to the whole surface of the body, might with advantage be employed to stimulate the nervous system generally, or possibly for some specific effect in special cases.—*The Practitioner*, 1892, No. 286, p. 272, and No. 287, p. 335.

NOTES ON EUCALYPTUS OILS.

MR. T. H. MAIDEN classifies the different species of eucalyptus that yield oils into—(1) scented oils, from *E. Baileyana*, *dealbata*, *maculata*, *Staigeriana*; (2) mallee oils ["mallee," an aboriginal word applied to dwarf eucalypti], from *E. dumosa*, *gracilis*, *oleosa*, *incrassata*, *pyriformis*, *uncinata*; (3) other oils, from *E. amygdalina*, *globulus*, *goniocalyx*, *hæmastoma*, *mitrocorys*, *piperita*, *Planchoniana*, *papulifolia*, *rudis*, *solabris*. The active principle of all oils is *eucalyptol* (Aneol), $C_{10}H_{18}O$; specific gravity, 0.930. One mallee oil is so rich in eucalyptol that in a freezing mixture it solidifies to a pasty mass. The eucalyptus oil is obtained from the leaves only, and frequent cutting of the branches of the gum-trees causes the fresh growth of young leaves to spring forth. The young leaves contain oil in greater quantity and of better quality than old ones. The wood contains no essential oil.—*The Pharmaceutical Journal of Australasia*, 1892, No. 5, p. 23.

[This communication possesses especial interest now that a controversy is being carried on, in that it is the testimony of a local observer.—R. W. W.]

SARSAPARILLA.

PROF. R. KOBERT has investigated the three active glucosides of this drug: 1. Parillin, $C_{26}H_{44}O_{10} + 2\frac{1}{2}H_2O$. 2. Saponin, $5(C_{20}H_{32}O_{10} + 2\frac{1}{2}H_2O)$. 3. Sarsasaponin, $12(C_{22}H_{36}O_{10} + 2H_2O)$. From his experiments he concludes that if there is a specific action for this remedy, the principal part of its activity resides in the sarsasaponin. However, he believes that it would be of great advantage to be able to say whether sarsaparilla, and particularly sarsasaponin, is an incomparable remedy for syphilis; if it is a remedy for syphilis, whether cheaper derivatives of saponin cannot be substituted for it; or whether sarsaparilla has any importance in the treatment of syphilis.—*Deutsche medicinische Wochenschrift*, 1892, No. 26, S. 601.

POISONING BY WATER OF JAVAL.

M. E. POTIER reports a fatal case when the amount swallowed was probably about two quarts. The symptoms of which the patient complained were burning sensations in the throat, epigastrium, and abdomen; death followed in eight hours. The necropsy showed: The epithelium of the tongue was denuded, and it was of a dark color, the papillæ being strongly marked; the pharynx and œsophagus presented the same appearance, the lesions, however, were superficial and only in the epithelial layer. The vestibule of the larynx was congested and red, but there was not any œdema of the vocal cords. There was marked distention of the intestines, and they were strikingly pale.

The mucous membrane of the stomach was œdematous, but pale and thinned. The intestine was likewise thin, especially in the cæcum; the ileo-cæcal valve was healthy. The liver was of normal volume and consistence, but anæmic, as was the intestine, and no blood flowed upon section. The kidneys were slightly congested. Nothing abnormal was found in the heart or lungs. The chlorine of the Javal water was probably the cause of the poisoning. The reporter questions whether its action upon the hæmoglobin was the cause of the speedy death. It was worthy of remark that the lesion had extended over a very large surface of the digestive tract.—*Bulletin de la Société Anatomique de Paris*, 1892, No. 14, p. 381.

THE TREATMENT OF THE URIC-ACID CONDITION.

DR. JAMES WOOD, believing that the presence of an abnormal quantity of this acid in the renal excretion shows a condition of suboxidation of the nitrogenous elements of the food-stuffs, and the absorption of the products of but partial oxidation leads to a profound state of malnutrition, with all its accompanying symptoms and sequelæ, feels the management of these cases to be of great practical importance. His treatment is as follows:

1. Excretion of all kinds must be thoroughly stimulated, and the refuse taken from the body by cathartics, sudorifics, diuretics, etc. 2. Selection of a diet which can be completely oxidized into its final products, and which will give the body sufficient energy to sustain it in its vital action. Skimmed milk should be exclusively used until the urine shows that the percentage of uric acid is nearly normal, and the cravings for solid food becomes unbearable. This may require from four to eight weeks. 3. Next, selection of those food-stuffs which will give us the requisite amount of albuminous principles to meet katabolism, or bodily waste, combined with sufficient of the carbohydrates to keep up the needed supply of energy. The proportion between the two great food classes should be as one to one; the daily amount varies with environment and amount of exercise, generally from ten to sixteen ounces of pure nutritious elements.—*Merck's Bulletin*, 1892, No. 5, p. 239.

THE TREATMENT OF ALOPECIA.

DR. H. PASCHKIS divides this disease into two classes for the purpose of treatment. When this condition is due to seborrhœa he recommends washing the head with alkaline soaps, specifying a liquid soap with the addition of 1 per cent. of carbonate of potash. For permanent removal of the oily matters, coal-tar-benzine with twice its weight of absolute alcohol, but this must be used only by daylight. Occasionally an alcoholic solution of resorcin, 1:30, with a small amount of castor oil, is advisable, as well as the naphthol soaps now to be found at the apothecaries. Of late years he has used 10 to 20 per cent. of ichthyol in lanolin; this, however, must be preceded by an energetic washing with soap.

Sometimes the daily use of alcoholic preparations of tannin and quinine are useful; such preparations are often found in the shops. Although the treatment is likely to be prolonged, yet the prognosis is generally favorable. The cases where there are scale-formation, pityriasis, or scanty secretion of the sebaceous follicles, are more difficult to treat. Here the washing with

soaps has no place, but oils and pomades are required. Here, also, are used stimulating remedies of 4 to 6 per cent. alcoholic solutions of tincture of cantharides, oil of savine, tincture of capsicum, or tincture of hellebore, either daily or three times weekly. If this condition is accompanied with hyperidrosis, then local faradization and reconstructive remedies, as iron or arsenic, are required.

The cases of trichorrhæxis nodosa are entirely unsatisfactory from the standpoint of therapeutics, although sometimes pilocarpine, both locally and internally, may be of service. Alopecia areata apparently is spontaneously cured, quite as often as by remedies, although usually disinfectants and irritants are prescribed.—*Centralblatt für die gesammte Therapie*, 1892, No. 6, S. 321.

THE TREATMENT OF ACUTE TONSILLITIS.

DR. CH. ELOY, believing that acute tonsillitis is of microbial origin, contagious and as well infectious, strongly insists upon disinfection of the mouth, destruction of enlarged tonsils by ignipuncture to close the avenues of infection, and in the segregation of those predisposed to this disease. Isolation, then, is social prophylaxis. He practises internal antiseptics by salol, salicylates, naphthol, to prevent infection; or, if it have already occurred, to combat it. The diet is regulated, tonics and antipyretics are ordered, not only to modify the symptoms but as well to place the organism in the best possible condition of defence against the invading microbes.—*Revue générale de Clinique et de Thérapeutique*, 1892, No. 19, p. 291.

A CASE OF CEREBRAL SYPHILIS.

PROF. E. DE RENZI reports a case of cerebral syphilis, localized in the pons (left facial and right corporeal paralysis, left palatal and œsophageal paralysis). A man of forty-three years, disease of nine months' duration; roseola and nocturnal headache for five months; slight paralysis of right side three months previously, which had recovered under iodide of potassium. The present symptoms came on suddenly; the voice was changed and deglutition became impossible. The urine contained ten times the normal amount of acetone. After daily injections of one-sixth of a grain of corrosive sublimate there was marked improvement; he could take food without the use of an œsophageal tube; the paralysis had greatly improved.—*Gazetta degli Ospitali*, 1892, No. 72, p. 671.

The following papers are worthy of mention:

"Two Cases of Diabetes Mellitus, Treated by Syzygium Jambolaum," by DR. WOLD. GERLACH, in *St. Petersburger medicinische Wochenschrift*, 1892, No. 19, S. 181. Report unfavorable.

"The Treatment of Diphtheria," by DR. S. SWARTZ, in *Internationale klinische Rundschau*, 1892, No. 21, S. 850. Recommends insufflation every four hours of one part sodium sozoiodol with four parts of flowers of sulphur.

"The Dietetic Treatment of Diseases of the Stomach," by DR. EMMERICH

HERTZKA, in *Wiener medizinische Presse*, 1892, No. 25, S. 1003. A carefully written and instructive paper.

"The Treatment of Facial Acne," by DR. ALEX. RENAULT, *Revue générale de Clinique et de Thérapeutique*, 1892, No. 23, p. 353. A careful paper, thoroughly studying both local and general measures.

"Anæsthesia," by DR. W. M. L. COPLIN, *Therapeutic Gazette*, 1892, No. 6, p. 370. A brief, practical, and scientific paper, which should be carefully read by the junior assistant house surgeons.

"The Curative Property of the Electric Current," by DR. MAX WEISS, *Centralblatt für die gesammte Therapie*, 1892, Heft 7, S. 385, claims a broad field of disease for its use.

"Two Cases of Chronic Alcoholic Hepatitis, Followed by Cure," by DR. FRÉMONT, *L'Union Médicale*, 1892, No. 70, p. 833. These cases give a better prognosis to this condition.

"The Treatment of Tabes," by PROF. LEYDEN, *L'Union Médicale*, 1892, No. 68, p. 805; No. 71, p. 841. A carefully written paper.

"The Destruction of Morphine in the Animal Organism," by PROF. P. PELLACANI, *La Rassegna di Scienze Mediche*, 1892, No. 5, p. 197.

MEDICINE.

UNDER THE CHARGE OF

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ORIGIN AND SEAT OF EPILEPTIC DISTURBANCE.

VICTOR HORSLEY limits his remarks to idiopathic or general epilepsy, convulsions of children, reflex epilepsy, etc., as distinguished from Jacksonian epilepsy and hystero-epilepsy.

The phenomena which mark an attack (without aura) of this kind are: 1, semi-voluntary movement—*e. g.*, rising into a standing posture; 2, change in respiration, inspiratory spasm with cry and commencing asphyxia; 3, in the worst cases with loss of consciousness (instantaneous); 4, muscular spasms (tonic stage); 5, muscular spasms (clonic stage); 6, exhaustion.

Loss of consciousness. The observations of Strümpell and the extirpation experiments of Goltz show that the cerebral hemispheres are the essential regions which contribute to the conscious state. This warrants the assumption that loss of consciousness must be brought about by some agency which abrogates the functional activity of the cortex cerebri. Such agency may be

extrinsic (*e. g.*, action of a narcotic poison through the circulation on the elements of the nerve centres from the outside so as to paralyze their activity), or intrinsic, as when (*e. g.*, in the hypnotic state) suitable stimulation of the optic or auditory (sensory) nerves may very profoundly depress the functional activity of the cortex cerebri. At present the only thing we know that would produce such a condition is, as just stated, a strong afferent excitation. It has been the fashion to attribute the loss of consciousness to extrinsic agencies, and the most remarkable assertions have been made as to the ability of the circulation to produce the effect in question. It should be borne in mind that the experiments of Kussmaul and Tenner, upon which so much stress has been laid in this connection, involved not merely anæmia as a cause of the convulsions, but also asphyxia, since the effect of the ligatures was to cut off the nutrition of the respiratory centre. A yet more fundamental criticism which should be applied to these experiments is that the convulsions they evoked are of a quite different type to those of the general or so-called idiopathic epilepsy.

The argument in favor of cortical anæmia drawn from the pallor of the face is shown to be worthless. Experimental results point strongly in the opposite direction. In a large number of epileptic fits induced in monkeys by injecting essence of absinthe, the cortex became hyperæmic. These observations have been confirmed and extended by Todoesky. In a patient of Horsley's, who had an epileptic fit during an operation in which the "motor" area was exposed, this became distinctly hyperæmic during the attack. These facts prove that there is no ground for the gratuitous clinical assumption that the brain is anæmic.

Does the agency which produces the epileptic fit strike the whole of the neural axis at once, or only one part of it?

When absinthe is injected after complete division of the spinal cord no fit can be evoked from the centres below the section, thus proving that although in the complete attack the spinal nerve centres are being used at least as conductors, if not participators, they, nevertheless, have no power when irritated by absinthe of initiating the convulsion, and it becomes, therefore, a definite conclusion that somewhere in the encephalon must be the starting-point of the fit. In which part of the encephalon cannot at present be answered positively. But we are justified in concluding that even if they be not the starting-point of the convulsions, the hemispheres, that is, their cortical mantle, are affected very early in the convulsion, and in many cases where loss of consciousness and, consequently, the fall, are the initial symptoms it is clear that the epileptogenous agent, if it does not commence its action therein, at least attacks the cortex at the same time as it does other parts.

Next, as regards the changes in respiration and phonation, it is to be remembered that both these functions are now known to have extensive cortical representation, so that their disturbance is not necessarily an indication of changes in the medulla oblongata.

Muscular spasms. The order of events, as far as the muscles are concerned, is tonus, followed by clonus. The question arises: What nerve centres in the neural axis are capable, when excited by any kind of agency, of producing this definite effect of tonus followed by clonus? In the vast majority of

instances faradic stimulation of the spinal cord or bulb produces in the main a tetanic contraction, and in the vast majority of cases it is not followed, when the excitation is left off, by any clonic stage. On the authority of all observers the nerve centres, in the basal ganglia, the mid-brain, and the cerebellum may also be excluded. On the other hand, electrical excitation of the cortex in the so-called motor region has, in the hands of most observers, evoked this characteristic tonus followed by clonus. A knowledge of the kind of impulses which come down along the spinal cord during a fit is, however, still required to enable one to determine whether the tonus-clonus sequence is due to the encephalic centres, or whether the spinal centres are not exerting their influence as well. By recording the "action currents" by means of an electrometer, Gotch and Horsley have shown that the impulses which the cortex delivers and sends down the cord are of the characteristic form of tonus followed by clonus, thus proving that the "motor" part of the epileptic disturbance is seated in the cortex of the hemispheres. To sum up: "Whatever be the point which the epileptogenous agency first attacks, we must conclude that the principal seat of the disturbance of a general or idiopathic fit must be the cerebral hemispheres, and especially their cortical mantle. Further, that the condition of the cortex during an attack is one of congestion and not anæmia; and, finally, that in all probability this portion of the encephalon is actually the place of origin of the disturbance."—*British Medical Journal*, 1892, No. 1631.

THE URINE IN PHTHISIS.

DR. W. HALE WHITE describes (*British Medical Journal*, 1892, No. 1638) the following conditions in the urine of phthisical patients: In seven out of nine urines examined the urine remained acid a very long time. In 182 specimens examined only 36 remained acid less than five days and 4 remained acid for over one hundred days. All the urines were left at the temperature of the ward and freely exposed to the air at first.

The sediment which formed in the acid urines consisted of amorphous urates and abundance of uric-acid crystals. If it had remained acid some time abundance of yeast-like organisms could be found in it, but very few bacilli. The change is, therefore, in many respects the same as that described as acid fermentation. Most urines developed a peculiar smell not unlike that detected in sewage-purification works.

Many of the acid urines became darker and darker, becoming eventually black when seen in bulk, though only dark-brown when in thin layers. This change usually took a month or more; once black, the urine remained so, even if kept for nearly a year. The cause of the darkening is obscure; it is not, however, due to pyrocatechin.

These peculiarities could not be connected with any symptom observed during life or with any post-mortem change. None of the patients who died had any local disease of the genito-urinary tract. The condition of the urine was not related to any particular drug or diet. It seems most probable that these peculiarities of the urine are due to the excretion in that fluid of some of the direct or indirect products of the action of the tubercle bacilli.

is now poured into another vessel. The specific gravity, taken with an ordinary aërometer, will be that of the blood. It is important that the chloroform and benzol be thoroughly mixed, but care is to be taken that the drop of blood be not broken up. Observations upon forty adults by this method gave an average specific gravity of 1.0605 for males and a little lower for females. It was determined that when the specific gravity fell as low as 1.045, the proportion of hemoglobin was less than 50 per cent. The ingestion of large quantities of water was followed by a transitory lowering of the specific gravity, while copious perspiration was followed by an elevation. It was found that changes in the specific gravity of the blood corresponded with variations in the proportion of hemoglobin.

UNILATERAL SYRINGOMYELIA.

DÉJÉRINE and SOLTAS (*Compt.-rend. hebd. des Séances de la Soc. de Biologie*, 1892, No. 28, p. 716) have recorded the case of a man, sixty years old, who, seven years previously, had noticed weakness in the right upper extremity, to which, two years later, muscular wasting was added, progressing to such a degree that he was compelled, four years later, to give up his work as a mixer of colors, into the composition of some of which arsenic entered. During two years the patient had several times burned himself with his pipe without suffering pain. He presented a cervico-dorsal kyphosis. The muscles of the hand, of the distal half of the forearm, and the brachialis on the right, were atrophied. The first phalanges were extended, the second flexed and the last semi-flexed. Fibrillary contractions were wanting. Motility was impaired in correspondence with the degree and extent of muscular atrophy. Tactile sensibility was everywhere found preserved. Thermic sensibility was lessened in all parts of the body, except upon the head, face, and neck; while both thermic sensibility and the sensibility to pain were abolished throughout the entire right upper extremity and the adjacent portions of the trunk, anteriorly and posteriorly. Cutaneous trophic changes were absent. The muscular sense was intact. The knee-jerks were slightly exaggerated. The elbow-jerk was abolished on the right, but preserved on the left. Smell, taste, and hearing were intact. There was concentric limitation of the visual fields, the more pronounced for colors. The sphincters were continent. A diagnosis of unilateral syringomyelia was made. During the twenty-one months that the patient was under observation the muscular atrophy made little progress, while the sensibility remained unchanged. Death took place as the result of intercurrent pneumonia. At the autopsy the encephalon and membranes were found intact. In the right half of the spinal cord, from the level of the second pair of cervical nerves to the upper portion of the lumbar region, at the junction of the anterior and posterior cornua, there existed a cavity lined by thickened membrane. The cavity was largest at the level of the cervical enlargement, and grew smaller thence upward. In the cervical region the posterior cornua, the posterior two-thirds of the anterior cornua, and the anterior two-thirds of the columns of Goll and Burdach, were destroyed. At the level of the fifth pair of cervical nerves the left anterior cornua was compressed at its base by the growth. At the level of the seventh pair, the glioma, at the expense of

which the cavity had been formed, was but little excavated. In the upper part of the dorsal region the growth occupied the base of the posterior cornua, extending to the periphery of the cord between the columns of Goll and Burdach. Here it had begun to invade the gelatinous substance of Rolando upon the left. Lower down the excavation again became more pronounced. In the lumbar region, the base of the posterior cornua had been destroyed. The cord was normal at the lumbar enlargement. The right anterior nerve-roots in the cervical region had undergone slight atrophy. The other nerve-roots were normal. The wasted muscles presented a condition of simple atrophy.

PRIMARY SPLENOMEGALIA.

At a meeting of the Société Médicale des Hôpitaux, DEBOVE (*L'Union Médicale*, 1892, No. 90, p. 177) announced that, in addition to the enlargement of the spleen found in connection with various acute and chronic diseases, with leukaemia and pseudo-leukaemia, the spleen sometimes undergoes primary enlargement. The affection is of insidious invasion. Sometimes the first symptoms are local—a sense of heaviness, discomfort, or pain in the left hypochondrium; there may be attacks of severe pain, due to circumscribed peritonitis. At other times general symptoms first appear—loss of strength, pallor, apathy, and emaciation. The spleen will be found to be voluminous, irregular, bosselated, and indurated. The number of red blood-corpuscles and the quantity of hæmoglobin are diminished, but there is no excess of colorless corpuscles. Digestion is deranged. Hæmatemesis is frequent, and in some instances so profuse as to threaten life. Epistaxis and intestinal hemorrhage are also common. The course of the affection is slow; it may last for ten or twelve years; it usually terminates fatally after the development of a cachexia. Fever is absent, save during attacks of peritonitis. The lymphatic glands are not involved. The liver is usually more or less enlarged and cirrhotic. The condition is thought to depend upon a fibrous hyperplasia. Nothing is known in an etiologic connection. In treatment, a milk diet and the administration of large doses of arsenic are advised.

A CASE OF LEUKÆMIA AND DIABETES.

REBITZER (*Prager medicin. Wochenschr.*, 1892, No. 31, p. 356) has reported the case of a man, fifty-six years old, who, in his twenty-sixth year, had an attack of malarial fever, from which he thoroughly recovered. In his fiftieth year debility and sharp pains in the legs appeared. At the same time several small abscesses formed on the chest and on the right upper eyelid. Diabetes was diagnosticated. Following an attack of left-sided pleurisy, four months before the patient came under observation, it was noticed that the abdomen was enlarged and that a hard body could be felt below the left costal arch. There was no history of alcoholism, and venereal infection was denied. The patient had lost flesh and was pallid. The lower extremities were œdematous, as were the penis, scrotum, and abdominal walls. There were evidences of ascites. The spleen was palpably enlarged. The post-cervical, epi-trochlear, and axillary glands were also enlarged. Both retinæ presented punctate and

linear hemorrhages. The urine contained both albumin and sugar, as well as granular casts. The number of red corpuscles in the blood and the quantity of hæmoglobin were diminished, while the number of colorless corpuscles was increased. A diagnosis of diabetes, leukæmia, and chronic nephritis was made. Dyspnœa became marked; sleep disturbed; cyanosis decided; the pulse rapid; strength failed, and death took place. At the autopsy, liver, spleen, kidneys, and axillary, inguinal, mediastinal, and retro-peritoneal lymph-glands were found enlarged. There were effusions in both pleuræ and in the peritoneum. Microscopically, the blood was found to contain many mononuclear leukocytes and a small number of polynuclear leukocytes; in the marrow of the sternum mononuclear and polynuclear leukocytes were likewise found. In the kidney the uriniferous tubules contained hyaline casts; some glomeruli were degenerated; the interstitial connective tissue was slightly increased; leukocytes were present in abundance; the epithelium of the uriniferous tubules responded to the iodine test for glycogen. The lymphoid structure of the spleen was increased. The liver contained large numbers of leukocytes. The pancreas presented no alteration. The enlarged lymphatic glands had undergone hyperplasia.

THE ETIOLOGY OF LEUKÆMIA.

PAWSOWSKY (*Deutsche medicin. Wochenschr.*, 1892, No. 28, p. 641) in four cases of leukæmia found short, spore-containing bacilli, with rounded extremities, staining best by treatment for from twenty-four to forty-eight hours with a watery solution of methylene-blue. The organisms were principally outside of the leukocytes. They varied in length from 0.002 to 0.003. Culture experiments were successful, but inoculation failed. Corresponding organisms were found in the liver, spleen, lymphatic glands, intestinal canal, lungs, kidneys, brain, and spinal cord from three fatal cases of leukæmia. The organisms were especially numerous in the liver. It is concluded that leukæmia is a disease of the blood, the bacilli present, by a chemotactic influence upon the blood-making organs, inducing a hyperplasia of the leukocytes.

THE PATHOGENESIS OF ARTHRITIC MUSCULAR ATROPHY.

In support of the view that the muscular atrophy observed in association with affections of the joints is reflex, HOFFA (*Beilage zum Centralbl. f. Chir.*, 1892, No. 32, p. 51) has demonstrated that the atrophy does not occur when the integrity of the reflex arc is destroyed. Thus after cutting the posterior roots of the third, fourth, and fifth lumbar and the first sacral nerves in dogs in which subsequently purulent inflammation of both knee-joints was set up by injection of silver nitrate, muscular atrophy took place upon the left but not upon the right side. The process is conceived to depend upon an irritation transmitted from the articular nerve-endings to the centres in the spinal cord governing the nutrition of the muscles affected. The extensors of the joints are predominantly affected, partly on account of the anatomic relations between the nerves that supply the joint and those that supply the extensor muscles, and partly because the atrophied muscles are the tensors of the capsule of the diseased joint. The atrophy is simple in character, so that the muscles do not present reactions of degeneration.

SURGERY.

 UNDER THE CHARGE OF

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 EPISPADIAS IN THE FEMALE.

AUFFRET (*La Sem. Méd.*, 1892, No. 19) reports a case of malformation of the urethra in a woman, nineteen years of age, which resembled the condition of epispadias in the male. The meatus was represented by a simple linear fissure, the inferior lip alone being clearly marked. The urethral canal, clitoris, and nymphæ were absent above, and the middle portion of the labia majora also was poorly developed. The hymen was intact, but dilated to permit the passage of the completely prolapsed uterus. There had been incontinence of urine from infancy.

 HÆMATOMA OF THE FOLD OF THE ELBOW.

CHARVOT (*La Sem. Méd.*, 1892, No. 19) claims that hæmatoma here is nearly always the result of rupture of the brachialis anticus, due most frequently to complete posterior luxation of the elbow. The clot organizes and presents the appearance of a tumor the size of an egg, rounded, with a mamillated surface, and of the consistence of cartilage, or even of bone. It is deeply situated at the base of the internal bicipital groove in the coronoid fossa, and gives rise to a partial ankylosis of the elbow. Operation is indicated when it does not tend to disappear.

 CASES OF GALL-BLADDER SURGERY.

ABBE details (*N. Y. Med. Journ.*, vol. lv., No. 5) four cases of biliary obstruction which were subjected to operation. The patients all recovered.

The first case was one of recurring attacks of biliary colic lasting over a period of four months, with a history of a single attack five or six years before. The patient was a woman sixty-four years of age. On account of the pain and biliary obstruction she was becoming exhausted. A tumor the size of an egg was found in the region of the gall-bladder. A vertical incision was made over the tumor, and the enlarged gall-bladder popped out of the wound as soon as the peritoneum was opened. Three good-sized stones were found, the two smaller of which were wedged tightly in the cystic duct. The stones were with difficulty worked back into the gall-bladder and removed. A small gum-elastic bougie then passed into the common duct and onward with ease. The wound in the gall-bladder was closed, fine cat-

gut being employed to unite the muscular layer and the finest black silk to unite the peritoneal edges. The abdominal wound was closed in separate layers by buried sutures. Convalescence was uninterrupted and complete. At this time, six months after the operation, the patient remains in perfect health.

The second case is that of a young woman with gall-stone and suppurating gall-bladder. The patient had a tumor on the right side below the ribs, with progressing debility and hectic. The tumor was as large as the fist and tender. It had been diagnosticated as cancer. The same incision was used as before. The gall-bladder presented a malignant appearance. It was incised, when the walls were found to be from an inch to an inch and a half in thickness, and resembled and cut like carcinomatous tissue. The cavity of the gall-bladder held but two drachms of muco-purulent fluid. No foreign body could be felt. Convalescence was uneventful, but the sinus did not close, and the mass remained. Six months afterward the patient returned to have the sinus closed, when a gall-stone as large as a pecan-nut was found in the sinus; the tumor had disappeared. After removal of the stone the sinus healed promptly; the patient was in robust health.

The third case was a female twenty-nine years of age, with a history of biliary colic, lasting over a period of ten years. Operation was performed by vertical incision, and fifty-three small and large stones were evacuated. It was impossible to pass a probe into the common duct, but no stone could be felt. The gall-bladder was stitched to the abdominal wound, and a sinus persisted. Six months later the patient returned, when the gall-bladder was removed after ligature close to its junction with the hepatic duct. After removal it was found that a calculus the size of a pea was lodged in the duct. Very careful examination before removal failed to give any evidence of the presence of this stone. The abdominal wound was sutured. Rapid recovery followed, and three years later the patient remained in perfect health.

The last case was also that of a female, aged thirty-six years. The history was that of biliary colic, jaundice, loss of flesh, vomiting, enlarged liver, clay-colored stools, and urine the color of porter. The patient was in very poor condition, and her urine contained albumin and hyaline casts. The same incision as in the previous cases was made. Several moderate-sized calculi could be felt in the gall-bladder and cystic duct, and one as large as a walnut in the common duct. The gall-bladder was incised and the stones removed. It was necessary also to incise the cystic duct to release others, the incision being carried on to the common duct to free the stone lodged there. The common duct was sewn with the finest black silk, and the gall-bladder and its duct removed. The hepatic duct would admit the finger readily. A rubber drainage-tube was passed for a short distance into the hepatic duct. Over this was placed a larger tube, terminating at the site of the junction of the ducts, and around this iodoform gauze was packed, with the idea of draining all the bile out of the abdominal wound, and after a few days removing the inner tube, letting the larger one remain to drain the sinus. On the ninth day bile was apparent in the stools, and the jaundice progressively faded. At the end of four weeks the fistula, which had remained open, was strapped, and closure followed at once. This case illustrates that intense cholemia is not necessarily a contra-indication to operation.

A case is also reported in which operation was done for supposed empyema of the gall-bladder. The search was unsuccessful in locating the cause, and drainage was all that could be done. The man died a week later, when the autopsy showed a small, soft, malignant growth attached to the wall of the duct, just within its lower end.

It is emphasized that the four cases of obstructive disease reported were all progressing to a fatal end, and by operation perfect health was restored.

[As an interested observer of the operation in Case IV., it seems to me worth while to call attention to the ingenious arrangement of the drainage-tubes: This seemed to me at the time admirably adapted to meet the requirements of the conditions present, and the result shows that this was the case. —J. W. W.]

AMPUTATION AT THE HIP-JOINT.

MCCURDY (*N. Y. Med. Journ.*, vol. lv., No. 18) suggests the following modification of Wyeth's method of bloodless amputation at the hip-joint: A line is drawn from the most prominent point of the great trochanter to the perineum, a steel mattress-needle, three-sixteenths of an inch in diameter and a foot long, is entered on this line just internal to the femur, its point emerging just below the *tuber ischii*; this avoids all vessels, and a figure-of-8, made by throwing a round rubber tourniquet around the projecting needle ends, over the internal aspect of the thigh, prevents all possibility of hemorrhage. The cutting of the flaps, disarticulation, ligation of vessels, and dressing of the stump then follow.

RESULTS IN CASES OF HIP-JOINT DISEASE TREATED BY THE PORTABLE TRACTION SPLINT.

In the *New York Medical Journal*, vol. lv., No. 18, SAYRE reports seven cases of hip-joint disease treated by the portable traction splint, without immobilization, except during the inflammatory stage of the disease. The cases are reported in detail, and are worthy of careful study. In spite of the fact that several of the patients belong to tubercular families, and all were pronounced cases of morbus coxarius, the result in one instance was a functionally good joint, in the other six cases, physiologically perfect joints followed the treatment.

The statistics of 407 cases of morbus coxarius treated between 1859 and 1889 are given. Of these, 118 were in the first stage, 119 in the second stage, 82 in the third, 88 not stated. The results of treatment in the 407 cases were as follows:

Cured, motion perfect	71
“ “ good	142
“ “ limited	83
“ “ ankylosed	5
Unknown	78
Under treatment	14
Abandoned treatment	3
Discharged	2

Died of exhaustion	2
" of phthisis	1
" of pneumonia	1
" of tubercular meningitis	5
Total number of deaths	<hr/> 9

Cuts from photographs showing the amount of motion in some of these cases are very convincing, and argue well for this method of conservative treatment.

A NEW METHOD OF TREATING ACUTE URETHRITIS.

VAUGHAN (*New York Medical Journal*, vol. lv., No. 18) details the plan which he has recently developed for treating acute urethritis. He includes all forms of acute inflammations of the anterior urethra, whether specific or non-specific, as the same rule of treatment applies to all.

At the suggestion of Dr. Powers, the author began the use of dermatol in these cases. Preparations holding this substance in suspension were used with negative results. The mucilaginous principle extracted from Irish moss and from Iceland moss, combined with benzoin and glycerin (known as plasment) was found to be a very satisfactory basis for the application of dermatol to the urethra. The strength advised is from three to five per cent.

The method of applying this is as follows: The patient is requested to urinate, after which a soft rubber catheter about five inches long, and with numerous openings near the end on all sides, is passed and the urethra irrigated with warm water, or with warm chloride of sodium solution, one drachm to the pint of water. Without removing the catheter about half a drachm of the dermatol plasment is injected, either from a hard rubber syringe or a compressible tube fitted with a hard rubber tip, the catheter being gradually withdrawn during this injection. Absorbent cotton is applied over the meatus, and changed as often as necessary. Thorough antiseptics of instruments and hands is urged.

A long list of cases is tabulated, showing the results of this treatment. The author concludes from his studies: 1. That in the treatment of acute urethritis, soothing applications rather than irritants should be used. 2. That the passage of the soft rubber catheter recommended does not, as a rule, irritate the urethra; that if it does it should not be used. 3. That plasment is an excellent vehicle for urethral medicaments. 4. That dermatol in plasment is the most efficacious drug he has used in urethritis, although he has used no other drug in plasment. 5. That treatment by the above-described method has produced a milder course and fewer complications than that with other remedies that he had used.

Powers says that dermatol in uniform admixture with gelatin stopped the growth of the anthrax bacillus, staphylococcus pyogenes aureus, bacillus prodigiosus, bacillus of typhoid fever, and that of pneumonia.

[My own experience has led me to believe that methods of treatment which involve the passage of any instrument, even a soft rubber catheter, into the urethra during the acute stage of inflammation, are useless or worse than useless. Dr. Vaughan's results would seem, however, to show that, what-

ever pain or annoyance it may have caused the patient, it did not interfere with the process of cure.—J. W. W.]

CASES OF CHOLECYSTOTOMY.

Two cases of cholecystotomy for gall-stones are reported by GAY, in the *Boston Medical and Surgical Journal*, 1892, No. 17. The first was in a woman, aged thirty years, with pain, jaundice, vomiting, emaciation, debility, tenderness over gall-bladder but no tumor, clay-colored feces, and bile-stained urine. At the operation a calculus the size of a large pea was removed. Recovery was without event. Some months later the patient suffered from an attack of biliary colic.

The other patient was a woman, aged fifty-nine years. She presented the usual symptoms: jaundice, vomiting, pain, exhaustion, loss of appetite, high-colored urine, pale feces, and emaciation. After incision through the abdominal wall, firm adhesions existed everywhere. In separating these a profuse hemorrhage took place, which threatened the life of the patient. The gall-bladder could not be located on account of the adhesions, and as the patient was failing, further interference was abandoned, and the wound was packed with gauze. The patient died at the end of ten days. The autopsy revealed a calculus the size of a hazel-nut in the common duct.

THE REMOVAL OF NECROTIC AND CARIOUS BONE WITH HYDROCHLORIC ACID AND PEPSIN.

MORRIS (*New York Medical Journal*, 1892, vol. lv. No. 12) briefly considers this subject. The early attempts at decalcification of dead bone were unsuccessful for two reasons: First, although the superficial layers of necrotic bone were easily decalcified, the deeper portions remained unaffected by the acids; especially was this the case if there was caseous infiltration or fatty *débris*. Second, cellulitis was apt to develop during the treatment.

After much experimentation, the author has adopted the following method of treatment: An incision is made through the soft parts in the most direct route to the seat of dead bone, and, if sinuses are present they are all opened into the one large sinus, if possible. The latter is packed with antiseptic gauze and allowed to remain quiet until granulations have formed. This is not an absorbing surface, and the danger of cellulitis is practically *nil*. The next step consists in injecting into the sinus a 2 to 3 per cent. solution of hydrochloric acid in distilled water. If the patient is in bed, the injections may be made every two hours during the day; but if the patient is up and about, the acid solution is used at bed-time only. The patient should always take that position which favors the retention of the fluid. At intervals of two days an acidulated pepsin solution (pepsin, pure, 3ss, hydrochloric acid $\mathfrak{m}_{\text{xvj}}$, distilled water $\mathfrak{f}\mathfrak{ss}\text{iv}$) is thrown into the sinus. This will digest decalcified bone and caseous or fatty *débris* in about two hours. This treatment is to be continued until the sinus heals from the bottom, showing that the dead bone has all been removed. Even in tuberculous cases this treatment proves successful when combined with immobilization of the part and tonic constitutional treatment. If there is free suppuration, the cavity should be treated with a solution of peroxide of hydrogen before each injection.

Experiments made on the live turtle prove that exposed living bone is also susceptible to the decalcifying action of acids. In a 5 per cent. hydrochloric acid solution a piece of dried humerus of a man was decalcified in six hours. In the same solution the exposed part of the shell of a turtle was decalcified in thirty hours. Microscopic examination showed that the blood-vessels were destroyed where the shell had been decalcified. In practice, a wall of lymph and granulation tissue usually protects the healthy bone.

[Clinical experiments which I am now trying would seem to show a definite value in this procedure, especially in otherwise inaccessible foci of carious bone; but neither the number of cases, nor the time which has elapsed since the treatment was begun, justify a more positive statement.—J. W. W.]

GALL-BLADDER SURGERY.

RICHARDSON (*Boston Medical and Surgical Journal*, 1892, No. 17) reports the following cases:

A woman, aged thirty, had attacks of colic for seven years. When examined there was seen a considerable degree of jaundice, and the liver was somewhat enlarged. There was some tenderness over the gall-bladder, but no distention could be made out. Although the diagnosis of obstruction of the common duct, due to gall-stone, was made, the symptoms did not seem severe enough to demand operation. Suddenly, five months later, the patient developed symptoms of a violent peritonitis, and died. At the autopsy a large stone was found in the common duct, which had become perforated, causing peritonitis. The lesson taught by this unfortunate case, added to a considerable experience in gall-bladder surgery since, has led Dr. Richardson to strongly urge exploration in similar cases.

A man, thirty-nine years of age, had a tumor of the gall-bladder, with loss of flesh and persistent jaundice. There was a history of having passed a gall-stone. At the margin of the ribs on the right side there was felt a round, fluctuating tumor, with two or three hard nodules at the upper part. In spite of the probability that this case was of a malignant nature, exploration was advised. The gall-bladder was emptied by an aspirating needle of a quart of fluid as clear as water. Further examination revealed malignant disease in the neighborhood of the common duct, and nothing more was done. Death occurred ten days later. Post-mortem showed cancer of the liver, with primary disease of the head of the pancreas.

Another case was that of a male, aged fifty-eight years, with symptoms much like those of the last patient. The gall-bladder was stitched to the abdominal wall and opened. A pint and a half of pure bile escaped. The cause of the obstruction could not be ascertained. The patient died nine days after the operation. Autopsy revealed cancer of the head of the pancreas. In neither of these cases was the operation the cause of the fatal termination.

A woman, aged forty-one years, complaining of pain in the region of the stomach, loss of flesh, clay-colored stools, and vomiting, with evidences of malignant disease of the liver, was explored by abdominal section. The liver was found to contain numerous cancerous nodules. The wound was

closed. Recovery from the operation was rapid, but death occurred some months later.

Six cholecystotomies for gall-stone are detailed, five of which made good recoveries; the sixth died from sepsis.

Dr. Richardson places most weight on the history in making a diagnosis of gall-stone, while but little is attached to physical examination. A history of recurrent attacks of pain, with transitory jaundice, persistent discomfort for a long period of time, with a general cachexia, would point to cancer. The best incision, in the opinion of the author, starts a little to the left of the linea semilunaris, an inch from and parallel to the margin of the ribs, and carried across the fibres of the external oblique. If the gall-bladder is loose and presenting, it should be stitched to the abdominal wall before being opened; but if it is contracted and adherent, a glass drainage-tube is to be introduced and packed around with gauze. Siphonage may be made use of.

[The vertical incision is preferred by many operators. Tait, whose experience has been exceptionally large, always uses it. I have found that it gave an almost equally good exposure of the operative area, and could be much more quietly and easily closed than the oblique incision.—J. W. W.]

A CONTRIBUTION TO THE STUDY OF THE RESTORATION OF THE INFERIOR MAXILLA.

MARTIN (*Lyon Médical*, tome lxi., No. 13) describes the case of a man aged between forty and forty-five years, who on account of an inflammatory trouble of the lower jaw, suffered from necrosis of the two lateral aspects of the bone. The anterior portion, with the incisor teeth and those adjacent, was no longer in continuity with the remainder of the bone. Sequestra had been removed, after which cicatrization began. On account of the loss of bone healing was taking place in bad position; some intervention seemed, therefore, imperative. An apparatus was accordingly made, the anterior part of which served to fix the teeth of the fragment, while the posterior part took the place of the bone on either side which had been destroyed. Springs were interposed to keep up a continuous tension. The action of the apparatus was to carry the fragment forward to its normal position and at the same time to overcome the action of the depressor muscles. A slight modification of the appliance later became necessary. The author did not see the patient for three months, when the position of the lower front teeth was found to be almost if not quite normal. The final result was not what the author desired, owing to the lack of interest and perseverance of the patient; nevertheless, the deformity did not recur. The description of the apparatus is supplemented by a number of cuts, and the position of the jaw is also shown before and after treatment.

LARGE ECHINOCOCCUS CYST OF THE LIVER SUCCESSFULLY OBLITERATED BY LAPAROTOMY AND DRAINAGE.

RICHARDSON reports (*Boston Medical and Surgical Journal*, 1892, No. 17) the following instructive case: A man, aged thirty-two, who had always had good health, was taken about a month previously with what his physician called inflammation of the bowels. Although there was extreme nausea, he

could not vomit. Some days later the patient noticed a "knob" on the right side of the abdomen close to the ribs; this rapidly increased in size, and fever and chills developed, when he was brought to the hospital. At this time the patient had a large tumor in the right side of the abdomen, continuous with the liver dulness, and extending down to the crest of the ilium. There was dulness and distinct fluctuation over this area. Temperature 102° F., pulse 120. Although a positive diagnosis could not be made, the condition eminently warranted immediate exploration. An incision parallel with the fibres of the external oblique was made in the right flank, which exposed a tumor similar in color and appearance to the liver. This was sutured to the parietal incision with interrupted silk sutures. An aspirating needle withdrew pus. A free incision was then made which evacuated large quantities of pus. The opening became clogged with a jelly-like substance, which on being removed was evidently the daughter-cyst of an enormous echinococcus. At least five hundred cysts were removed by irrigation, varying in size from an English walnut to a pin's head. A large glass drainage-tube was introduced and packed around with gauze. The patient made a perfect recovery, and remains well up to this time.

NOTE ON TWO CASES OF CLUB-HAND OF CONGENITAL ORIGIN.

KIRMISSON and SAINTON (*Revue d'Orthopédie*, 1892, No. 2) describe two cases of congenital club-hand. This deformity is of rare occurrence. It has not yet a defined pathological anatomy. In most of these cases one of the bones of the forearm is either wanting or is more or less atrophied. In one of the cases reported the deformity was double.

In the work of Hoffa, which gives the most recent and interesting details on this subject, the absence of or lack of development of one bone of the forearm, is classified into the radial and ulnar varieties. Of these the former is much more common. The two cases reported in this paper were both of the radial variety. The numerous observations of Hoffa go to show that when the radius is absent the hand is supported by the ulna. In such cases this bone is very often curved like the letter S. In most cases the scaphoid and trapezius are absent from the carpus. The thumb and its metacarpus are also usually absent.

The first case detailed by Kirmisson and Sainton is that of a male child born in February and dying in November. Both hands were similarly deformed. At the autopsy the cause of death could not be ascertained. The dura mater was very adherent to the skull. The brain was much congested, but there was no liquid on the surface or in the ventricles. The viscera did not present any abnormality. The two arms were removed and preserved in chloral solution. Careful dissection of both arms and forearms showed the numerous muscular anomalies to be the same on the two sides. The humerus measured 10.5 cm., ulna 7 cm., radius 4.5 cm., each side being the same. The articulation at the wrist was very loose. The scaphoid and semilunar articulated with the inferior extremity of the radius. The cuneiform articulated with the ulna as usual. The disposition of bones of the carpus and its connections with the metacarpus was difficult to establish. On the internal border were seen the pisiform and cuneiform. The unciform articulated with

the last two metacarpal bones, the os magnum with the third metacarpal, and externally a little bone articulated with the second metacarpal. The carpal bones were not only deficient in number, but were also very small. The last four fingers had the usual three segments regularly formed. A finger occupied the position of the thumb, the first phalanx of which was 15 mm. in length, the second 7 mm., and a third of the same length.

The second case presents a club-hand on the right side. Child, eight months old, very large and asymmetrical head. The left hand is normal. The right arm is much shorter than the left. The arrest of development has taken place on the antebrachial segment. Left humerus measures 12 cm., ulna 8.5 cm., right humerus 11.5 cm., ulna 6 cm. The right forearm when at rest is flexed on the arm, and it cannot be extended beyond an angle of ninety degrees. The hand is at a right angle to the forearm and inclined toward the radial side. The lower end of the ulna projects prominently beneath the skin. The hand has three fingers, each appears to have a metacarpus. On the external border there is a finger much smaller than the others. It is inserted obliquely upon the first of the three fingers, but seems to have a rudimentary metacarpal bone. The radius is not apparent, at least the body and inferior extremity. The condition of the carpus is difficult to determine.

The first case belongs to the third class of Bouvier's classification. The second case being alive, it was impossible to determine the exact disposition of the bones and soft parts. It is to be remarked that a scar was seen at the position of the styloid apophysis of the ulna in all of these three cases—the first case being double.

PLEURISY AND THORACENTESIS.

LEREBOULLET (*Gaz. hebdomadaire de Méd. et de Chir.*, 1892, No. 20) urgently recommends the proper selection of cases for thoracentesis. He always begins the treatment of pleurisy by combating the pain, dyspnoea, and cough by applications of dry or wet cups, and the use of purgatives, diuretics, and milk diet. He does not apply blisters, but waits for defervescence, which should appear in from six to ten days. If the effusion is not excessive, and at the expiration of this time commences to disappear with a certain rapidity, thoracentesis is not indicated, and blisters, which now are of service, will suffice to cure the patient. Should the effusion remain stationary thoracentesis will be indicated. Puncture, however, is positively indicated in the acute sero-fibrinous pleurisy (pleuritic fever of M. Lancereaux) where the effusion steadily increases, with marked displacement of the viscera and pronounced dyspnoea. Even here medical treatment should be instituted in the beginning, and continued during the febrile period if the effusion remains moderate, but thoracentesis should be performed, not only should any accident supervene, but even if the diminution of the effusion does not commence simultaneously with the defervescence. Alongside of this form of pleurisy is found the so-called latent or rheumatoid form associated with a sero-plastic effusion. This is regarded to-day as tuberculous in nature, and only the puncture will result in a cure. The sooner it is performed the greater will be the chances of recovery.

OTOLOGY.

UNDER THE CHARGE OF

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OTITIC ABSCESSES OF THE BRAIN.

JANSEN, of Berlin, reported cases of otitic brain abscesses at the same time that Baginsky and Gluck reported their successful operation for the relief of a cerebral abscess from acute otitis. (See this Journal, July, 1892.) In Jansen's first case, the aural disease productive of the cerebral abscess was acute. (*Berliner klin. Wochenschrift*, 1891, No. 49.) The patient was a locomotive engineer, forty-six years old. In April, 1891, he was attacked with hardness of hearing and roaring in the ears. In a month later pain set in in the right ear and mastoid. The latter became swollen, but this condition subsided. By the end of June the aural pain became greater in the right ear, and spread throughout the entire right side of the head, especially in the brow and temple. These pains were unendurable. By the middle of June a swelling occurred again in the mastoid process, accompanied with vertigo, nausea, and vomiting, and the patient's memory failed. There was *at no time discharge* from the ear.

When the patient was received into the hospital, on August 3d, the pulse was frequent, no vertigo, no paresis, strength fair; the membrana tympani was swollen, dull red, no perforation; malleus invisible, mastoid swollen at the lower process, hearing very much impaired, intense pain in the right half of the head, but the latter part not sensitive on percussion. The mastoid was chiselled open the same day, and quite a large purulent collection found in it. This cavity was laid freely open without entrance into the middle cranial fossa. The pains in the right side of the head continued after the operation; they were, perhaps, a little less severe. On the fifth day after the operation vertigo occurred. On the 9th of August slight muscular weakness of the left arm was observed, and on the next day a similar condition was observed in the face and lower extremities of the same side. From the 10th to 17th great changes occurred in the parietic symptoms, with a general and gradual increase in the same. Somnolence, increased hardness of hearing, were superadded with vertigo and vomiting, while the headache remained undiminished. There was no choked disc, no fever, no slowness of pulse.

On the 17th the patient was examined by Dr. Oppenheim, who found the following condition: "Conjugate deviation of the eyes and head toward the right, left hemiparesis, with hyperæsthesia of the same side and left hemianopsia; slight exaggeration in the reflexes on the left." Diagnosis: "Abscess of the brain, located so as to involve the posterior part of the inner capsule and posterior part of thalamus."

On August 18th the squama was trephined above the auditory canal. A trocar was passed inward and upward, giving vent to a tablespoonful of fetid

pus. Then a crucial incision in the dura mater and an incision into the substance of the brain were made. The wound was tamponed with iodoform gauze. In the course of seven days nearly all the morbid phenomena had disappeared, after having presented an aggravation on the evening after the operation. By the 12th of October cicatrization was complete, and the patient left the hospital cured. On the 17th of October the patient returned to his home at a distance, and on the next day was seized with loss of appetite and vomiting. On the 21st facial paralysis and hemiplegia appeared on the left side, accompanied by loss of consciousness and convulsions. The wound became bulging and pulsatile. Death occurred on October 23d.

This case is especially interesting as cerebral abscess resulting from acute otitis media is very rare. Dr. Jansen, in the same communication with the above, gives the notes of two other cases of otitic cerebral abscess—one in a man thirty-four years old, the other in a boy eight years old, both subjects of chronic aural disease.

CEREBRAL COMPLICATIONS OF OTITIS MEDIA.

ALBERT ROBIN (*La Médecine Moderne*, 1891, No. 48), in the course of a clinical lecture on the above subject at the Hôpital de la Pitié, Paris, presented a case with the following symptoms and drew conclusions as here presented:

A woman, forty-six years old, was brought into the hospital delirious, with injected face and partial hemiplegia of the left side. There was, however, no facial paralysis; only a little stiffness of the nucha. Sensibility was intact; the pupils were normal; the axillary temperature 39.5° C.; pulse 110 to a minute, but regular. The heart was enlarged; there was Cheyne-Stokes respiration; the tongue was dry, grayish, and furrowed; there were incontinence of urine and slight albuminuria. The liver and spleen were apparently normal. In a few days the delirium diminished, and there was a tendency to coma. The face was less red and the tongue less dry, but the same stiffness of the neck continued with incontinence of urine and feces, and the hemiplegia was now complete. Diagnosis was not yet made. Four days later the temperature declined to 37.5° C., the delirium became much less, and the tongue normal. There was some diarrhœa, and the Cheyne-Stokes respiration continued. On the next day the coma returned, and the next day a *purulent discharge from the right ear* set in, which rendered the diagnosis clear. Endopericarditis infectiosa had been considered possible, but otitis had not been suspected. Two days later the patient was much calmer, with lucid intervals, and the paralysis diminished. In four days more the patient could move her arms and legs, but the stiffness of the neck, Cheyne-Stokes respiration, and paralysis of the sphincters continued. Four days later, *i. e.*, on the eighteenth day of the malady, all paralysis had disappeared, the intellect was entirely clear, and the patient could give her antecedent history, as follows: Typhoid fever at ten years of age; at twelve years St. Vitus's dance; ten years before the present illness puerperal fever. But the right ear had never been affected. Six months previous, however, the hearing had grown slightly dull in the right ear. Finally, a week before entering the hospital, she suddenly lost consciousness and fell when getting

into a carriage, that being the beginning of the illness for which she was brought to the hospital.

By the twenty-eighth day the discharge from the ear had entirely ceased, and in the course of four weeks more the patient had ceased to present any nervous phenomena. The case had presented, according to Robin, an instance of reflex nervous phenomena from an otitis media. These manifestations are brought about by contiguity existing between the petrous bone and the dura mater, by vascular or by nervous transmission. Had the ears been examined in this case when the patient was brought to the hospital, or even before that time, and the otitis media discovered, paracentesis of the membrana tympani would have in all probability been followed by prompt and entire relief from all the cerebral symptoms.

OPERATIVE TREATMENT FOR RELIEF OF CHRONIC SUPPURATIVE AFFECTIONS OF THE MIDDLE EAR.

DR. FREDERICK L. JACK, of Boston, reports three cases of chronic purulent otitis media relieved by operative removal of the necrotic membrana and malleus after other rational means had failed to give relief. Incidentally, he gives the ratio of perforation of the flaccid membrane in purulent otitis media as ten per cent. He does not state, however, whether this was the sole perforation in the membrana in these cases. The operations were performed upon the patients when anaesthetized. His conclusions agree with those of Sexton and C. H. Burnett, viz.:

1. The removal of the drum membrane and ossicles is attended with little annoyance to the patient, proof of which is sufficient to warrant the performance of the operation as the only means of cure in many cases.
2. The operation often produces marked improvement of the hearing.
3. Satisfactory results may be expected toward the relief of tinnitus and vertigo.
4. The results of the operation seem to be permanent.

Dr. Jack also says: "The possibility of hearing well without the membrana tympani, malleus, and incus has been successfully demonstrated in a number of cases; and this suggests what operative procedure may be expected to do in some cases of deafness due to hypertrophic catarrh of the middle ear, without fixation of the stapes. The distressing symptom of tinnitus has been relieved by the same operation. It has also been done with success in certain cases of disturbance of equilibrium, from pressure transmitted through the middle ear."—*Boston Medical and Surgical Journal*, vol. cxxvi., No. 22.

CAMPHORATED SALOL IN CHRONIC SUPPURATION OF THE MIDDLE EAR.

DR. PÉGOU has recently reported in the *Revue de Thérapeutique* very favorable experiences with camphorated salol in chronic suppuration of the middle ear. The formula for its preparation is as follows: "Equal parts of salol and camphor, mixed and heated until fusion is complete, without water, alcohol, or any other solvent. The mixture is then filtered and preserved in a yellow glass bottle, hermetically sealed. Thus prepared, camphorated salol is a thick, colorless, unctuous liquid, soluble in ether, chloroform, or oil, but insoluble

in water. Light and air decompose it rapidly." Its application is neither painful nor irritating, and it seems to possess the property of rapidly curing a distressing and very intractable disease. It is applied upon a small pledget or tampon of cotton-wool; to this may be attached a fine thread by which the patient can remove it after twenty-four hours. The ear should be previously washed out with a weak solution of boric acid, to be repeated once or twice daily when the tampon is not in position. The applications are to be made once in two or three days, and, if the suppuration is not profuse, the tampons may be left *in situ* from one application to another. The time required for a cure varies from four to twenty days. When it has not entirely cured it has always diminished the fetor and quantity of the purulent discharge.

OTOLOGICAL SECTION, AMERICAN MEDICAL ASSOCIATION.

At the meeting of the American Medical Association, Detroit, June 7-10, 1892, the following aural papers were read and discussed in the Section of Laryngology and Otology: "Mastoiditis — Opening; Temporary Relief; Craniotomy; Death from Cerebral Abscess; Autopsy Demonstration," Dr. H. Knapp, of New York. "Mastoid Cases," Dr. B. Alexander Randall, of Philadelphia. "Report of Five Cases of Mastoid Disease and Operation Therein," Dr. Milton Greene, of Grand Rapids, Mich. "Observation of a Case of Acute Otitis Media; Cerebral Abscess; Trepanation and Death," Dr. Charles H. Burnett, of Philadelphia. "Compressed Air and Sprays in Diseases of the Throat, Nose, and Ear," Dr. S. S. Bishop, of Chicago, Ill. "Observations upon Excision of the Drum-head and the Two Largest Ossicula," Dr. Charles H. Burnett, of Philadelphia. "Spasmodic Contraction of the Tensor Tympani Muscles," Dr. C. W. Richardson, of Washington, D. C. "Peroxide of Hydrogen and its Use in Ear Disease," Dr. W. B. Johnson, of Paterson, New Jersey. "Excision of Auditory Ossicles in Chronic Aural Catarrh, with Report of Failure," Dr. H. V. Würdemann, of Milwaukee, Wis., and "Treatment of Opacities of the Membrana Tympani," Dr. Francis Dowling, Cincinnati, Ohio.

There were in all sixteen papers upon aural subjects on the programme, but the above were the only ones presented at the meeting.

AMERICAN OTOLOGICAL SOCIETY.

There were eighteen papers presented at the recent meeting of the above-named society, July 19th of this year. Of these, nine, or one-half, were upon the subject of mastoid disease, presented respectively by Drs. O. D. Pomeroy, B. Alexander Randall, Charles J. Kipp, Clarence J. Blake, H. Knapp, J. B. Emerson, T. Y. Sutphen, Gorham Bacon, and D. B. St. John Roosa. Other subjects were treated of as follows: Dr. B. Alexander Randall, of Philadelphia: "Preliminary Notes on Craniometric Studies in Relation to Aural Anatomy." Dr. J. B. Emerson, of New York: "A Case of Pyæmia following Acute Suppurative Otitis; Recovery." Dr. Samuel Theobald, of Baltimore, Md.: "On the Value of Weak Solutions of Bichloride of Mercury in the Treatment of Otitis Media Suppurativa (1 to 8000 was the usual strength)." Dr. F. L. Jack, of Boston: "Remarkable Improvement in Hearing by Re-

moval of the Stapes." Dr. C. J. Blake, of Boston: "Middle-ear Operations (a Plea for the Removal of the Stapes in Cases of Immobilization of this Bonelet)." Dr. D. B. St. John Roosa, of New York: "A Case of Exostosis of the External Auditory Meatus." Dr. R. A. Reeve, of Toronto: "A Case of Exostosis of the Meatus, which Caused so much Pain by Pressure on the Opposite Wall as to Demand Operation." Dr. E. E. Holt, of Portland, Me., exhibited an auricle bitten off by a horse, and made a brief report of the case; and Dr. C. J. Blake exhibited the plans for the new Aural Building of the Massachusetts Charitable Eye and Ear Infirmary, at Boston.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF
J. SOLIS-COHEN, M.D.,
OF PHILADELPHIA.

SPASM OF THE LARYNX.

IN an article on the trembling of the vocal bands and the disorders of phonation in disseminating sclerosis of the spinal cord (*Ann. des Mal. de l'Or., du Larynx, etc.*, 1892, No. 2), M. J. COLLET, of Lyon, reports an instance in Garel's clinical service, presents a summary of the similar cases previously reported, and makes some general observations. He sums up the functional disorders of the laryngeal muscles into a monotonous and scanning voice, brusque change of tone, elevation of pitch, impossibility to maintain the same note for a long time, stridulous inspiration interrupting laughter or weeping, paralysis of some of the muscles of the larynx, and, finally, the tremulousness of the vocal bands. These phenomena may be combined, or exist isolated, or succeed each other as in the case related.

Collet refers to a case of pharyngo-laryngeal nystagmus reported by Herbert R. Spencer in the *Lancet*, October 9 and 16, 1886.

Under the heading, "A Case of So-called Laryngeal Vertigo," DR. L. ADLER, of New York, reports (*N. Y. Med. Journ.*, 1892, No. 5) a case in which spasmodic cough frequently produced sudden loss of consciousness without vertigo; and which was cured by clipping an elongated uvula. Quite a full summary of the literature of laryngeal vertigo follows the description of the case, which occurred in a gouty man fifty-three years of age. Attention is directed to the circumstance that in all the recorded cases, except one, the patients have been males, most of whom had passed their fortieth year before their first attacks.

OPPENHEIM reports (*Neurologische Centralblatt*, 1892, No. 5) a case in which there was a tumor the size of an egg in the cerebellum, with marked flattening of the pons and of the medulla oblongata. The roots of the vagus

and of the accessorius were very hyperæmic, with numerous bleedings and a rather well-advanced atrophy. During life there had been trembling of the head and of the upper extremities on voluntary movements only. But there had been a continuous rhythmic tremor of the soft palate as well as of the outer and inner musculature of the larynx.

The larynx was continuously drawn up and lowered. The rhythmic contraction of the crico-thyroid muscle could be felt externally; and on laryngoscopic inspection continuous tremblings (*Zuckungen*) of the inner laryngeal muscles and the movements of the arytenoid cartilages could be seen. These manifestations, which produced disturbances in deglutition, as well as in speech and voice, had been observed in varying intensity for a period of about two months.

LARYNGITIS.

DR. RAGONEAU calls attention to the development of catarrhal laryngitis in riders on bicycles and tricycles (*Rev. de Lar., etc.*, No. 22), which he attributes to the inclination of the body forward in speeding, to the necessity for mouth-breathing, and the access of air to the air-passages under pressure produced by rapid movements.

TUBERCULOSIS OF THE LARYNX.

DR. A. BERTELS, of Riga, reports (*St. Petersburg. med. Woch.*, No. 21) two cases in which laryngotomy was practised after preliminary tracheotomy, and the diseased tissues in part scraped away and in part destroyed with the thermo-cautery. Despite good results at first, no tendency to cicatrization was manifested; fresh ulceration took place and both cases terminated fatally, permanent tracheal fistules remaining after removal of the canulas.

LARYNGEAL FORCEPS.

DR. DUNDAS GRANT recently exhibited before the British Laryngological and Rhinological Association (*Journ. of Lar.*, vol. v., No. 12) a pair of guarded double-jointed cutting forceps modelled upon the oral and pharyngeal scissors devised a few years ago by Sherwell, of New York.

A pair of hinged prolongations jointed at their distal extremity form a lozenge-shaped aperture when the forceps are opened, while the hinged distal extremity effectually guards from any other injury than the mere pressure of any tissues with which it may come in contact. It is intended for the removal of growths projecting from the sides of the larynx.

KERATOSIS OF THE LARYNX.

Under the caption, "Circumscribed Keratosis of the Larynx," DR. G. JUFINGER describes (*Wien. klin. Woch.*, 1891, No. 47) a peculiar bilobed morbid growth occupying the anterior commissure of the glottis and involving the inferior surfaces of the vocal bands, and occurring in a sixteen-year-old female, the subject of ozæna; a few delicate-pointed white projections from the smooth and glistening surface of the growth, and resembling little frag-

ments of bristles or of spicula of fish-bone. Under the microscope these projections were found to consist of an outer sheath of parallel cornified epithelium and a central sheath of irregular epithelium. The histological appearance of these projections and of the basal portion of the growth from which they originated are detailed and illustrated. In view of the abnormal cornifying process which the epithelium had undergone the disease is named circumscribed keratosis of the larynx. The change of ciliary epithelium into squamous is attributed to inflammatory processes, although no evidence of transitional forms could be detected in any of the preparations examined.

MIXED TUMORS.

DR. L. GRÜNWARD of Munich, relates (*Munch. med. Woch.*, No. 41, 1891) an instance in a three-year old child from whose larynx, after tracheotomy, he removed a fibroma from the base of the epiglottis endolaryngeally, and subsequently removed several masses of cauliflower papillomata after direct access by laryngo-fissure. At a later date recurrent papillomata at the base of the epiglottis were removed with the snare.

CONGENITAL OCCLUSION OF THE POSTERIOR NARES.

SOLLY exhibited to the Clinical Society of London (*Journ. of Lar. and Rhin.*, 1892, No. 2), a girl, sixteen years of age, in whom an occluding septum had been perforated and the opening kept patent.

OBSTETRICS.

UNDER THE CHARGE OF

EDWARD P. DAVIS, A.M., M.D.,

PROFESSOR OF OBSTETRICS AND DISEASES OF INFANCY IN THE PHILADELPHIA POLYCLINIC;

CLINICAL LECTURER ON OBSTETRICS IN THE JEFFERSON MEDICAL COLLEGE;

VISITING OBSTETRICIAN TO THE PHILADELPHIA HOSPITAL, ETC.

THE PREPARATION OF MILK FOR INFANT FEEDING.

ROTCHE, in the *Boston Medical and Surgical Journal*, July 21, 1892, selects the milk from a common herd of good average condition. In prescribing milk, he orders fat (in cream or in separated milk), milk-sugar and albuminoids. Freshly prepared lime-water is also employed where indicated. Accepting the researches of Leeds (*JOURNAL*, June, 1891), which show that sterilization at 212° F. is injurious, he prefers to sterilize at 167° F. He has found an apparatus for separating the fat from the milk by centrifugal force especially useful, only 0.13 per cent. of fat remaining in milk so treated; the "separator" has the further advantage of removing dirt and other foreign matter from the milk. To milk so treated but one-twentieth of lime-water is added to secure a proper reaction.

ECTOPIC GESTATION.

LAWRENCE (*Bristol Medico-chirurgical Journal*, 1892, No. 36, vol. x.) reports several interesting cases of extra-uterine pregnancy. In one (an abdominal pregnancy) the placenta was allowed to remain after the separation of the cord. It became absorbed without disturbance, the patient making a good recovery. In other cases suppuration occurred in the placenta which remained, and septic infection ensued. In such patients the rule should be to remove the placenta, if possible without severe bleeding; if not, it should be left and the abdomen opened at the first rise of temperature and the placenta removed. A description of several typical cases of ruptured tubal pregnancy closes the paper.

SYMPHYSIOTOMY.

CHARPENTIER, in the *Nouvelles Archives d'Obstétrique et de Gynécologie*, 1892, Nos. 5 and 6, reviews the literature of the subject, which is chiefly Italian. So far as primary results are concerned, Spinelli's twenty-four operations resulted in the saving of all the mothers, and of twenty-three of the twenty-four children. The operation is performed under antiseptic precautions, the cutaneous incision is closed with catgut and dressed with bichloride gauze. After delivery the patient has three vaginal douches daily, at first of bichloride of mercury solution 1 to 2000, afterward 1 to 4000. The pubes are firmly united in from a month to six weeks, and during that time the patient remains in bed and wears a firm bandage. No case of permanent non-union is reported, the pubes being commonly strongly knit together.

The operation is indicated in cases of the pelvis not so highly contracted that a living fœtus cannot be afterward delivered by version, or, preferably, the forceps. In very highly contracted pelvises it is not indicated. Symphysiotomy is advantageous in patients at term with living child in whom the true conjugate of the pelvic brim measures from $3\frac{1}{2}$ to $2\frac{3}{4}$ inches. When the pelvic diameter is smaller than that the Cæsarean section or embryotomy should be performed. Symphysiotomy and induced labor are sometimes successful when the pelvis is smaller than the dimensions given.

PERFORATION OF THE AFTER-COMING HEAD.

WINTERNITZ (*Centralblatt für Gynäkologie*, 1892, No. 28) recently encountered the case of a patient who had borne four children in difficult labors. She had a symmetrically contracted pelvis whose true conjugate was three inches. Her child was large, and lay in breech presentation. The body was delivered with difficulty, the head could not be born. It was impossible, from lack of space, to use Smellie's scissors. Decapitation was performed, and the head was turned, by supra-pubic pressure, so that the occiput presented. It was fixed by external pressure and perforated, the brain broken up and evacuated with the finger, and the head delivered by the cranioclast. During the delivery sudden free hemorrhage followed the premature separation of the placenta. The placenta was easily delivered, the uterus and vagina douched. The patient had a normal puerperium.

RUPTURE OF THE UTERUS DURING ABORTION.

HEKTOEN (*American Journal of Obstetrics*, July, 1892) reports two cases of extraordinary mutilation of the uterus and abdominal organs during the performance of criminal abortion. In one a rubber catheter had been inserted in a uterus three and a half months pregnant, and the fœtus had been expelled. The abortionist then attempted to remove the placenta, scraping the uterus with a sharp spoon and pulling upon what he supposed to be the cord. A physician summoned in consultation found the patient dying and a loop of intestine protruding from the vagina.

At the post-mortem examination it was found that the catheter had perforated the uterus and lodged behind the liver. In attempting to remove the placenta the abortionist had torn open the cervix and pulled down a loop of intestine.

In the second case a midwife attempted to remove the placenta after spontaneous abortion at four months, by pulling upon the cord. Peritonitis ensued, and a physician curetted the uterus with a dull wire curette. Only half of the intra-uterine douche which was given returned. The patient died twenty-six hours afterward.

At a post-mortem examination the fundus of the uterus was found to have largely disappeared. The most probable explanation of the case is that the midwife produced partial inversion of the uterus by pulling upon the cord, and then gouged off the uterine tissue, supposing it to be the placenta. There is no reason to believe that the dull wire curette in the hands of the physician had anything to do with the rupture of the uterus.

ABDOMINAL PREGNANCY.

In the *Zeitschrift für Geburtshülfe und Gynäkologie*, Band xxiv., Heft 1, SUTUGIN reports two cases of abdominal pregnancy with full post-mortem notes and microscopic examination of specimens. He concludes from his observation of such cases that they occasionally go to term. In early pregnancy they closely simulate intra-uterine pregnancy. Symptoms of compression of the bowel and urethra are manifest earlier than in other kinds of ectopic pregnancy. When the placenta is behind the uterus severe pelvic and sacral pain is felt. The diagnosis is made by a tumor behind the uterus; in the second half of pregnancy a round cystic tumor is found in the abdomen, in which fetal parts can be felt; in front of the tumor is the uterus. Heart sounds may be heard, but not placental souffle as in tubo-abdominal pregnancy. It is unusual for contractions in the fetal sac to be felt. The vagina is found encroached upon by an elastic compressible tumor resembling a placenta to the touch. The vagina is elongated; the cervix is high up; the uterus is enlarged.

When rupture of the sac and bleeding occur, Douglas's pouch should be opened at once. When the fœtus is viable or has perished some time previously, abdominal section is indicated.

GYNECOLOGY.

 UNDER THE CHARGE OF

 HENRY C. COE, M.D., M.R.C.S.,
 OF NEW YORK.

CARCINOMA AND FIBRO-MYOMA OF THE UTERUS.

EHRENDORFER (*Archiv für Gynäkologie*, Bd. xlii., Heft 2) has carefully examined the evidence on this disputed subject and arrives at the following conclusions: 1. The association of cancer and fibro-myoma of the corpus uteri is less rare than has been heretofore supposed, and its clinical importance should be recognized. 2. In every case of hystero-myomectomy, before treating the stump, the specimen should be examined to see if the endometrium has undergone cancerous degeneration. 3. If cancer is found in addition to the fibro-myoma, or even if the former is suspected, complete extirpation should be practised. 4. No method of treating the stump after hystero-myomectomy (even though excision and cauterization of the cervical mucosa) can promise entire immunity from recurrence under these circumstances. 5. If in a case of fibroid uterus there is a watery, sanguineous discharge, accompanied with severe colicky pains (especially at the climacteric), the development of malignant degeneration of the corporeal endometrium should at once be suspected and a radical operation should be performed.

[We have repeatedly emphasized the importance of thoroughly exploring the uterine cavity with the curette in cases exhibiting the symptoms above described *before* resorting to the radical operation. Only thus can we positively exclude sloughing intra-uterine fibroid.—H. C. C.]

RETRO-PERITONEAL TREATMENT OF THE STUMP AFTER SUPRA-PUBIC AMPUTATION.

JOHANNOVSKY (*Archiv für Gynäkologie*, Band xlii., Heft 2) regards Chrobak's method as the ideal one. He reports five successful cases, two of hystero-myomectomy and three of Porro's operation, in all of which the cervix was preserved but was treated extra-peritoneally. Chrobak (who has had seventeen successful cases) has described his method at length, its essential feature being the fact that two peritoneal flaps are dissected from the anterior and posterior surface of the tumor, which are afterward united over the surface of the stump, drainage being secured by carrying a strip of iodoform gauze down through the cervical canal into the vagina. Johannovsky thinks that in cases of Porro's operation, in which the uterus has become infected, it would be better to remove the entire uterus and drain *per vaginam*, not closing the peritoneal wound.

ALBERT (*Wiener med. Presse*, 1892, No. 29) credits Goffe and Dudley, of New York, with priority in the conception, if not in the exact technique, of this operation. Albert has himself modified the method of treating the stump as follows: After ligating the upper portions of the broad ligaments the mass

of the tumor is removed, the cervical canal is cauterized, tamponed with gauze, and temporarily sutured. The stump is then shelled out of its peritoneal covering as low as the level of the uterine arteries, which are tied and the entire supra-vaginal portion of the stump is excised. There is left a pouch of peritoneum, at the bottom of which is the small remaining portion of the cervix; this pouch is sutured into the lower angle of the wound (being carefully united to the parietal peritoneum), and is drained in the usual manner from above, which drainage may also be maintained *per vaginam* through the cervical canal.

PRIMARY CANCEROUS DEGENERATION OF UTERINE FIBRO-MYOMATA.

EHRENDORFER (*Centralblatt für Gynäkologie*, 1892, No. 27) reports a case of this nature, the existence of which was formerly denied by competent pathologists, even by Gusserow. The development of cancer in this connection may be referred either to the endometrium covering the fibro-myoma or to a change in its internal structure. In the former case the disease is doubtless due to the presence of chronic hyperplastic endometritis, the hypertrophied glands growing downward into the substance of the tumor, as in cases reported by Buhl and Hofmeier. These are to be carefully distinguished from such a case as that described by Ruge and Veit, in which cancerous degeneration of a myoma was clearly secondary to malignant disease of the endometrium. Klob and Gläser describe cases of true carcinomatous degeneration of the fibro-muscular tissue, to which class belongs that reported by the writer. Others have been reported by Buhl and Galalien.

HYSTERECTOMY FOR FIBROID TUMORS—PÉAN'S METHOD.

PÉAN (*Gazette de Gynécologie*, August 1, 1892) claims to have reduced the technique to the simplest form by pursuing the following method: The tumor is constricted with a rubber cord as near to the cervix as possible, and the mass is removed; if there are several lobes each is constricted separately and removed. It is not always necessary to dissect away the bladder and rectum from above, but this may readily be done. The stump is now encircled by a wire, is trimmed down as much as possible (sparing its serous covering), and the abdominal wound is closed. The stump, with the wire, is then removed *per vaginam*, the broad ligaments being secured with forceps.

TUBAL MENSTRUATION.

LANDAU and RHEINSTEIN (*Archiv für Gynäkologie*, Band xlii., Heft 2) throw fresh light on this interesting subject by their study of the condition of the mucous membrane of the genital tract in cases of atresia and malformation. Their observations were briefly as follows: The endometrium was unchanged. The tubal mucosa alone appeared to have been functionally active, having undergone general hypertrophy. In cases of atresia, as well as of malformation of the genital tract, mucosa was at first normal throughout, but the endometrium subsequently became destroyed in consequence of the pressure of the retained menstrual blood; the mucosa of the tube was most resistant, on account of its greater power of absorption, but finally it also

suffered from pressure. Hitherto there have been two theories with regard to the origin of hæmatosalpinx in cases of atresia—the reflex theory of Goupil and Bernutz, and the view that the blood transudes from the tubal mucosa. Although the former is probably correct, it has not yet been positively proved. The writers believe that they are the first to present anatomical facts which seem to substantiate the latter view. In the most striking case the tube was uniformly swollen, its serous covering was deeply congested, and the mucous membrane was much thickened and filled with blood-corpuscles, the vessels, not only of the mucosa but of the entire tubal wall, being greatly dilated. The uterus, on the contrary, was absolutely normal, neither the endometrium nor the muscular tissue showing any signs of congestion or infiltration, the vessels containing little blood, and the uterine cavity being empty. It would seem to follow from this that the tubes had menstruated, and that they alone took part in the process.

PARENCHYMATOUS INJECTIONS OF SALINE SOLUTION IN ACUTE ANÆMIA.

KORTMANN (*Deutsche med. Wochenschrift*, 1892, No. 16) is opposed to intra-venous infusion of saline solution in cases of hemorrhage, because the resulting increase in the blood-pressure favors a renewal of the bleeding. Even when the source of the hemorrhage has been controlled by ligature or tamponade, the over-filling of the venous system may lead to cardiac paralysis.

He prefers subcutaneous injections, except when the circulation is so depressed that absorption does not take place, when a few ounces may be infused into a vein. He injects above twenty ounces of a one-half per cent. solution beneath the fascia of the thighs. Of six cases of intra-venous infusion only one was successful, while four out of five cases of parenchymatous injection survived.

THE INTERNAL CROSSING (UEBERWANDERUNG) OF THE OVUM.

VEIT (*Centralblatt für Gynäkologie*, 1892, No. 27) criticises the views of Wyder and Pestalozza on this vexed question, who sought to show by reference to certain anatomical specimens that the impregnated ovum might escape from one tube into the uterus, and crossing the uterine cavity enter the opposite tube. The affirmative evidence was deduced from cases of tubal pregnancy in which the distal end of the affected tube was impervious; but, as is well known, the closure may occur *after* impregnation has taken place. All the evidence seems to be in favor of the belief that this supposed internal crossing of the ovum never occurs.

COMBINED TUBERCULOUS AND GONORRHOEAL ENDOMETRITIS AND SALPINGITIS.

SAULMANN (*Centralblatt für Gynäkologie*, 1892, No. 27) reports the case of a young woman with purulent endometritis, who suffered from severe shooting pains in the lower part of the abdomen. A drop of pus from the cervix was found to contain tubercle-bacilli as well as gonococci. Under the use of vigorous anti-specific treatment (vaginal irrigation with four per cent. solution of nitrate of silver and intra-uterine applications of corrosive sublimate, and

chloride of zinc solutions) the gonococci diminished in number and finally disappeared, but the tubercle-bacilli remained unchanged. There were no evidences of pulmonary disease. The writer cites this case as an evidence of the valuable aid afforded by the microscope in the diagnosis of the origin of uterine discharges, the intractable varieties of which will usually be found to contain specific microorganisms. In the case reported salpingotomy alone would not have been sufficient to eliminate the tuberculous focus, which was in the uterus as well as in the tubes, but hysterectomy was also indicated.

THE POSITION OF DERMOID CYSTS WITH RELATION TO THE UTERUS.

FREUND (*Centralblatt für Gynäkologie*, 1892, No. 31), after discussing this question at considerable length, arrives at the conclusion that when a dermoid cyst is found anterior to the uterus it has developed in an ovary which was congenitally displaced, and that when displaced it tends, like a normal ovary, to return to its former position.

THE TREATMENT OF INOPERABLE CARCINOMA BY INJECTIONS OF ALCOHOL.

SCHRAMM (*Centralblatt für Gynäkologie*, 1892, No. 31), adopting Schulz's suggestion, practised deep injections of alcohol in severe cases of cancer of the cervix uteri, but was obliged to abandon the treatment on account of the unbearable pain which they occasioned. Although the hemorrhage ceased in some instances during the treatment, there was no change either in the appearance of the diseased parts or in the amount of foul discharge.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

CIRRHOSIS OF THE LIVER IN CHILDHOOD.

JOLLYE (*British Medical Journal*, April 23, 1892, p. 858) presents the histories of two cases of hepatic cirrhosis occurring in children of the same family, one a boy, aged eleven years, the other his sister, aged ten years. The family history was free from any signs of rickets, syphilis, or scrofula; the parents were temperate; and neither of the children had been given alcohol for any purpose for more than four years before death. The only facts bearing any relation to the question of etiology were that both children had previously had measles and that both of them were inordinately fond of vinegar, which they would drink at every possible opportunity. To this

habit the author is inclined to attach some importance, believing that vinegar, by lessening gastric secretion, may so interfere with digestion as to cause the formation of digestive irritants (albumoses and allied bodies) which, after absorption by the portal system, are capable of setting up a hyperplasia of the connective tissue related to this system in the liver.

A recent paper by STACK (abstracted in THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, June, p. 728) analyzed a series of 20 selected cases of this disease occurring in children under twelve years of age, averaging five years; and, leaving out cases of fibrous change due to previous gummatous formations, that author found no evidence to confirm the view that syphilis, rickets, or malaria could be considered as holding any etiological importance. In the present paper JOLLYE analyzes 112 cases under eighteen years of age, and, as might be expected from the approximation to adult age, he finds that alcohol and syphilis act as causes, but to a much less extent than at one time was supposed. The conclusions which he formulates may be given *verbatim* :

1. That alcohol, syphilis, tuberculosis, and malaria account for 50 per cent. of the cases, the other most frequent causes being probably the exanthemata and errors in diet.

2. That acute interstitial hepatitis is frequently found microscopically after the infectious fevers, especially after measles and scarlet fever; but the part played by the disease, alcohol, and diet respectively in those cases which afterward become examples of cirrhosis is an open question, as is also the reason why some livers are affected with the hypertrophic, and others with the simple form.

3. That the symptoms may be wholly referable to the nervous system, the relation of the pathological changes in the liver to those in the brain being undetermined.

4. That severe pyrexia, quick pulse, and increased frequency of the respirations are frequent symptoms, and may make difficult the diagnosis from tuberculosis, typhoid, and other fevers.

5. That the symptoms of failing health in children, with no marked adequate cause, especially if associated with epistaxis or other hemorrhages, the development of nævoid growths, or the occasional presence of jaundice, should lead us to examine the liver for signs of cirrhosis.

6. That the later symptoms depend upon whether the canal system of the liver is chiefly involved, or whether the parenchyma chiefly suffers.

7. That nearly half the cases occur between the seventh and thirteenth years, and that males are nearly twice as frequently attacked as females.

8. That if all severe symptoms disappear under treatment they will certainly reappear and end fatally within, at the outside, as far as we know at present, a period of three years.

9. That the best treatment appears to be a tonic one, combined with special treatment for special symptoms.

10. That some cases are part of a general disease, due to some poison getting admission to the general circulation, and especially attacking the liver, owing to the slow circulation in the hepatic capillaries, just as, no doubt, acute yellow atrophy is a general disease, the chief pathological change found *post-mortem* having caused it to be classified amongst the diseases of the liver.

THE RESORCIN TREATMENT OF PERTUSSIS.

In the *Annales de la Policlinique de Paris*, 1892, June, p. 265, MONCORVO, of Rio de Janeiro, again calls attention to the continued success of his treatment of pertussis by local treatment of the peri-laryngeal mucous membrane by resorcin. This method of treatment was proposed by Moncorvo in 1883, and has been generally adopted by the profession in Brazil, but has found little favor upon the continent of Europe, although strong supporters have been found in every country where it has been carefully tried. The exact technique of the procedure is important in order to secure satisfactory results, and the author now gives careful directions for its successful practice. He prepares a chemically pure solution of resorcin in sterilized water, of a strength of 10 per cent. The applicator consists of a thick brush of very fine hairs affixed to a long handle of flexible iron wire, which can be readily moulded to suit the proper curvature of the patient's mouth and throat. In addition to these preparations a large vessel of boiled or sterilized water is kept close at hand, and in this the brush is rinsed after each application to the throat. The child is held sitting upon the mother's lap, its body inclined backward a little upon her breast. Sometimes, but not always in the author's experience, with older children, it is necessary to have an attendant hold the hands. The applications are made during the day, every two or three hours, according to the gravity of the case, each *séance* affording four to six brushings with the resorcin solution. When there is excessive excitability of the laryngeal mucous membrane, the first few brushings are preceded by an application of a cocaine solution of a strength of 5 to 10 per cent., care being taken that the brush is not strongly charged with the solution, and that only one brushing is made. Such applications of cocaine are generally made twice a day, in the morning and evening. In the gravest cases the author employs, in addition, antipyrine in daily-dose of 1 to 3 grammes, according to age, and inhalations of pyridine, which latter drug he claims to have been the first to recommend for this purpose. By this method of treatment the author has established a perfect prophylaxis for children obliged to live with others suffering from the disease, has often aborted an attack at the beginning in twenty-four hours, and has cured well-marked cases in periods varying from nine days to two weeks.

Note to Contributors.—All contributions intended for insertion in the Original Department of this Journal are only received *with the distinct understanding that they are contributed exclusively to this Journal.*

Contributions from the Continent of Europe and written in the French, German or Italian language, if on examination they are found desirable for this Journal, will be translated at its expense.

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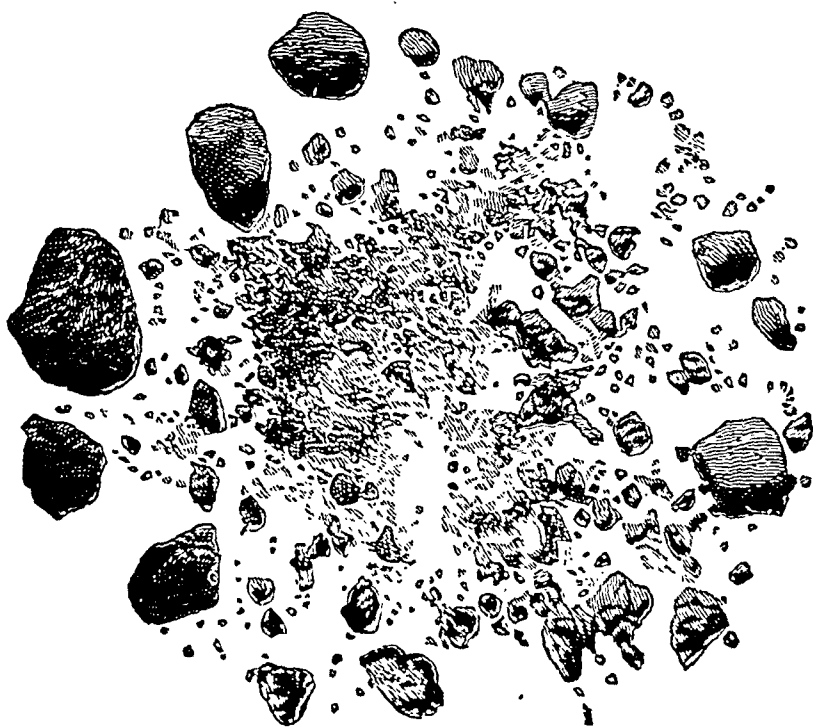
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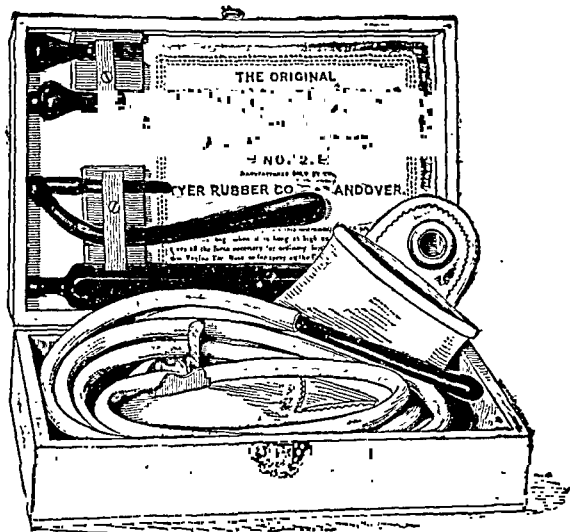
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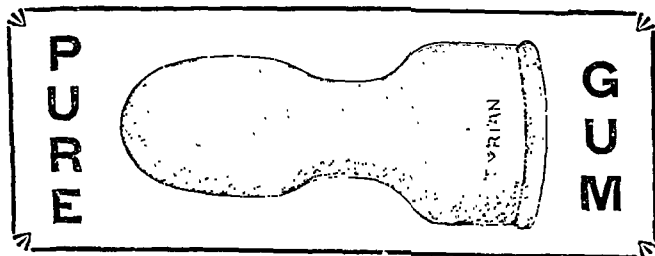
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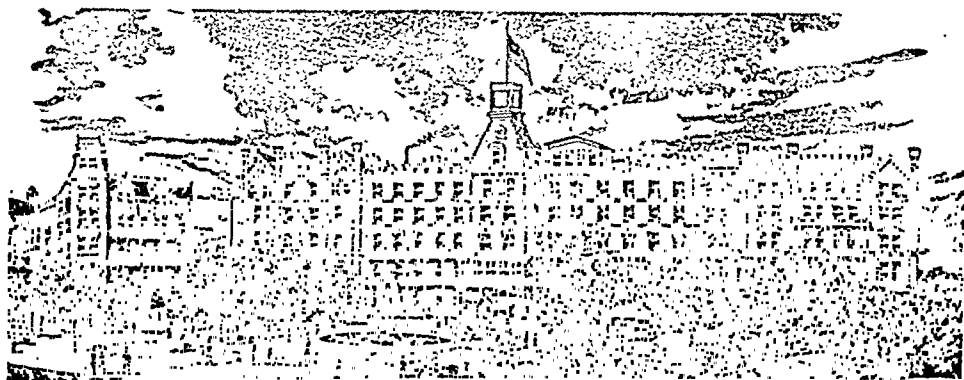
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
The Surgical Treatment of Epilepsy. By A. G. GERSTER, M.D., and B. SACHS, M.D.	503
A Case of Tumor of the Pons in which Tapping of the Lateral Ventricles was done for the Relief of Intra-cranial Pressure. By THEODORE DILLER, M.D.	509
A Case of Leukæmia which Terminated Fatally by Retro-peritoneal Hemorrhage. By THOMAS OLIVER, M.A., M.D., F.R.C.P.	515
Three Cases of a Hitherto Unclassified Affection Resembling in its Grosser Aspects Obesity, but Associated with Special Nervous Symptoms—Adiposis Dolorosa. By F. X. DERGUM, M.D.	521
The Prime Etiological Factor of Glaucoma is Constitutional. By S. O. RICHEY, M.D.	536
Hysterical Mania. By ELY VAN DE WAEKER, M.D.	546
Morphea with Maculæ Atrophicæ. By LOUIS A. DUHRING, M.D.	551
Three Cases of Dermatitis Herpetiformis Originating from Causes Connected with the Uterine Organs. By GEORGE T. ELLIOT, M.D.	553
The Question of Early High Amputation in Senile Gangrene. By CHARLES A. POWERS, M.D.	562
An Unusual Case of Tuberculosis. By W. M. L. COPLIN, M.D., and D. BEVAN, M.D.	565

REVIEWS.

A Text-book of the Principles and Practice of Medicine. By Henry M. Lyman, M.D.	570
The Origin of Inflammation and the Action of Noxious Inflammation-Exciting Substances, as Shown in Investigations Instituted Mostly on the Eye. By Dr. Theodor Leber	572
Contractions of the Fingers and "Hammer-Toe." By William Adams, F.R.C.S.	575
Charaka-Samhita. Translated into English. By Abinash Chandra Kaviratna	576
Essentials of Diagnosis. By Solomon Solis-Cohen, M.D., and Augustus A. Eshner, M.D.	577
Clinical and Therapeutic Researches upon Epilepsy, Hysteria, and Idiocy. By Bourneville.	578
The Uses of Water in Modern Medicine. By Simon Baruch, M.D.	580

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Treatment of Cholera	581	Treatment of Myxœdema with Thy-	
Protective Inoculation against Cholera	583	roid Juice	588
Filtered or Boiled Water?	584	A Case of Epilepsy Cured by Pasteur's	
Digestive Ferment of Carica Papaya	584	Antirabic Fluid	589
Treatment of Sea-sickness	585	Treatment of Delirium Tremens	589
Bromide of Strontium in Vomiting	585	Vegetable Albumin in Diabetes Mellitus	589
Treatment of Typhoid Fever by Thallin	586	Mercury Sozoiodol	590
Antipyretics in Typhoid Fever	586	Dermatol	590
A New Method of Treatment of Fever	586	Chloroform in Presence of Naked Flame	590
Syphilis of the Lingual Tonsil	587	Responsibility of Physicians in the	
Blisters and Bloodletting in Pleurisy		Use of Inhaled Anæsthetics	591
and Pneumonia	587	Tropa-cocaine as a Local Anæsthetic	591
Guaiacol in Pulmonary Tuberculosis	587	Toxicology of Male Fern with Special	
Dyspnœa and its Treatment with Drugs	588	Reference to Visual Disturbance	592

MEDICINE.

	PAGE		PAGE
The Cholera in Hamburg	593	Madura Foot of India	599
Fatal Leukæmia after Traumatism	595	Rupture of the Spleen in Ague	599
Arrested Cerebral Development	595	Rapidly Fatal Case of Cholera Morbus	600
The Microörganisms of Typhus Fever	596	Tumor of the Pineal Gland	601
Artificial Immunity to Cholera	596	Syphilis and Hypertrophic Osteo-arthropathy	602
Primary Erysipelas of Larynx	596	The Reflexes in Spinal Injuries	602
Hepatic Cirrhosis in Children	597	Blood-corpuscles in Health and Disease	602
Insanity from Sulphuretted Hydrogen	597	Primary Sarcoma of the Thymus Gland	603
Transformation of Smallpox to Cowpox	598		

SURGERY.

Aseptic and Septic Surgical Cases	604	Position of Gall-bladder Surgery	609
Technique of Antiseptic Treatment	606	Operation for Carcinoma of the Rectum	610
Shock and its Treatment	607	Gastrorrhaphy for Diminishing the Size of a Dilated Stomach	610
Death-rate of Penetrating Gunshot Wounds of the Abdomen	607	Pott's Fracture at the Ankle	611

OBSTETRICS.

Pathological Anatomy in Cases of Obstinate Vomiting during Pregnancy	612	An Analysis of Twenty-five Cases of Hydatidiform Moles	615
Cæsarean Section with Oöphorectomy for Osteomalacia	613	Modification of Labor in Cases of Extreme Maceration of the Fœtus	615
General Dropsy of the Fœtus	613	Ovariectomy during Pregnancy	615
Mammary Fistula	613	Study of the Lower Uterine Segment	616
Etiology of Intra-uterine Fractures	614	Treatment of Eclampsia	616

GYNECOLOGY.

Ventro-fixation of the Uterus	616	Total Disappearance of a Fibroid Tumor after Apostoli's Treatment	618
Cysts of the Hymen	616	Rapid Dilatation of the Uterus in Cases of Uterine Hemorrhage	619
Carcinoma and Endothelioma of the Ovary	617	Treatment of Ureteral Fistula	619
Ascites in its Relation to Gynecology	617	The Formation of Peritoneal Adhesions after Cœliotomy	619
Cysts of the Pancreas	617	Conservative Cœliotomy	620
Partial Non-development of Uterus	618	Development of Müller's Ducts	620
The Decidua in the Diagnosis of Extra-uterine Pregnancy	618		

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

Rhinolith	621	Morbid Growths of the Larynx	622
Abscess of the Maxillary Sinus	621	Adenoma of the Larynx	622
Myxoma of the Sphenoidal Sinus	621	Carcinoma of the Larynx	623
Disease of Tonsils and Palatine Folds	621	Cerebral Disease after Simple Operation in the Nose	623
Hemorrhage after Amygdalotomy	622		

PÆDIATRICS.

Etiology of Primary Larynx-Croup	624	The Galvano-cautery in Diphtheria	626
Hydrocephalus in Hereditary Syphilis	624	Chorea in the Negro	626
Another Treatment for Diphtheria	624	Appendicitis in Children	627
Resection of Rib for Cure of Empyema	625	Tubercular Retro-pharyngeal Abscess	628

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

NOVEMBER, 1892.

THE SURGICAL TREATMENT OF EPILEPSY.¹

BY A. G. GERSTER, M.D.,
PROFESSOR OF SURGERY IN THE NEW YORK POLYCLINIC,

AND

B. SACHS, M.D.,
PROFESSOR OF MENTAL AND NERVOUS DISEASES IN THE NEW YORK POLYCLINIC.

IN the following report we record our joint experiences in the surgical treatment of epilepsy. We have attempted, in an unbiased fashion, to study the effects of various surgical procedures upon the course of epilepsy, and in recording all cases that we have operated upon, no matter what the result, we are more apt to give a correct view of how much or how little surgery can accomplish in this special field than those can give who describe their short-lived successes and do not report the many dismal failures.

The cases operated upon were selected with considerable care. They were either cases of distinctly traumatic origin or in which a strictly localized convulsion pointed to a limited focus of disease. Cases of general epilepsy of non-traumatic origin were not subjected to operation.

The following table² gives a succinct account of the chief points of interest in ten cases; seven of these may be designated as cases of traumatic epilepsy, one was due to ear disease, one was a case of infantile cerebral hemiplegia with epilepsy, and one was a case of non-traumatic localized epilepsy due to early acute brain disease—a case of infantile cerebral palsy without palsy, but with epilepsy.

¹ Read at the American Neurological Association, June, 1892.

² We are indebted to Dr. E. Sternberger, house surgeon at Mt. Sinai Hospital, for his assistance in keeping and furnishing the records of most of these cases.

VOL. 104, NO. 5.—NOVEMBER, 1892.

No.	Name.	Sex and age.	History of case.	Date of operation.	Character of operation.	Occurrences after operation.	General result.
I.	L. C.	M. 6	Said to have had brain fever at age of 10 mos.; at age of 5½ years first right-side convulsion, repeated at interval of one week; right hemiparesis since first attack; athetoid and associated movements.	Dec. 29, 1890	Exposure by chiselling of motor area of right arm, determined by faradization. Dura tense and adherent; puncture; no cyst found.	Recovery excellent; no convulsions up to Feb. 2, 1891, when boy was discharged from hospital.	Immediate diminution of attacks; after leaving hospital had one mild attack; not heard from since.
II.	W.C.H.	M. 20	At age of 12 years was pushed back over pole of a wagon; supposed to have struck back of head (?); unconscious for a few minutes, but worked as usual; one week later general epileptic convulsions; has petit mal, and above all Jacksonian epilepsy involving muscles around right half of mouth. Occasionally eyes are involved. No loss of consciousness with majority of attacks.	Feb. 13, 1891	Exposed centre for representation of angle of mouth according to Horsley; adhesions under the button of bone; small cysts on dura; on puncture a little bloody fluid. Faradization over dura caused contraction only of r. angle of mouth. Large opening; button not replaced.	Attacks returned after operation and have not been diminished, and eyes are more frequently involved.	No improvement.
III.	M. K.	M. 16	At age of 18 months fell out of window; since that time epileptic attacks at varying intervals; has had tremendous doses of bromides; ill-tempered and stupid; stopped bromides; no attacks for three weeks, then left-sided convulsions becoming general.	Feb. 23, 1891	Large trephine opening over motor area for arm and leg, right side of skull.	Good recovery, but no cessation of attacks	No improvement.
IV.	E.L.M.	M. 30	Traumatic injury to right side of head; general epileptic attacks.	July 24, 1892	Trephining over occipital depression; adhesions over the depression.	Did very well except that he developed delusions of persecution.	Attacks returned within 2 weeks; alcoholic excesses.
V.	J. D.	M. 8	Traumatism at 7 months; 6 months previous to operation began to develop auditory and olfactory auras and then general epileptic spells; if ear ceased discharging spells became worse.	1st oper. Aug. 14, 1891 2d oper. Nov. 17, 1891	Opening of mastoid and removing two sequestra of bone. Mastoid opened again and silver canula to secure permanent drainage.	Facial palsy of left side. Sept. 10th first attack; repeated attacks Nov. 18th, convulsion of right side, but none since; last report August 15, 1892.	Great improvement after second operation; no spells up to date.
VI.	T. C.	M. 26	At age of 11½ years was severely kicked by a man over the right side of occiput; 6 months later epileptic attacks which have continued nocturnally about every 6 weeks since. No hemianopsia. Marked depression in skull; was for 8 weeks without any attack; attacks then returned.	Nov. 20, 1891	Trephining and chiselling over scar; tremendous exostosis almost doubling underlying part of brain.	Nov. 22, short spells; none while in hospital; discharged Dec. 15; has gone out West; has attacks every six weeks, but milder; reports that his memory is better.	Some improvement in severity of attacks eight months after operation.

No.	Name.	Sex and age.	History of case.	Date of operation.	Character of operation.	Occurrences after operation.	General result.
VII.	H. L.	M. 24	Six years ago fell down; thinks he struck on right side of occiput; one year later first attack, right hand and leg convulsed. At first had attacks six times daily, lately three or four times in two weeks.	Jan. 29, 1892 2d oper. Mar. 8, 1892	Motor arm centre on left side exposed; part of dura but no cortical tissue removed. Removed arm centre as determined by electrical tests, with slight resulting paresis.	Repeated attacks after both operations.	No improvement worth mentioning.
VIII.	C. D.	F. 9	Fell out of bed at six months, striking head against bare floor; at ten months a tedious illness, slow in development; at age of 5 years began to have innumerable convulsions (at least 50 per day). Idiocy. Parents insisting on operation.	Feb. 15, 1892	Large trephine opening over left side of head (motor area).	Attacks not quite so frequent as before.	Slight improvement.
	K. A.	M. 9	At age of 5 years had a "congestive chill" and spasms; no paralysis at the time; two or three years later developed Jacksonian epilepsy beginning in left hand without loss of consciousness; no evidence of palsy; boy feels left hand drawn up in cramp.	April 12, 1892	Excision of hand centre in right hemisphere; removed considerable tissue; hand was paretic for a few days.	Did very well in hospital for six weeks, but as soon as he left hospital and ran about got severe attack with loss of consciousness and involuntary passage of urine.	Some immediate improvement, but no lasting benefit from operation; in later attacks right arm was also involved.
X.	E. S.	M. 12	Two years ago was run over; fell backward, striking curbstone; unconscious for ten days, and had convulsions during this time; one year later convulsions became regular and frequent. Scar in left occipital region near median line.	May 27, 1892	Trephining and chiselling over occipital region.	Report not yet made.	

REMARKS, BY DR. SACHS.

I wish, first, to have a word to say regarding the determination of the brain areas to be operated upon. Working upon the rules laid down by Reed, Thane, and others, we have been accustomed to map out upon the skull with the greatest care, in advance of the operation, the exact site of the various divisions of the motor areas. Excellent as this practice is, I am now firmly of the opinion that in most cases it is quite unnecessary, and that the application of the faradic current to the dura will help us to localize centres much more carefully than any of the customary rules will.

At the last meeting of this Association doubt was expressed whether

faradization of the dura was apt to be successful.¹ My experiences during the past year have helped to strengthen the opinion expressed at that time, and I feel so certain of the absolute reliability of this procedure, that I would be willing to have the skull opened at any reasonable point over the motor areas and by means of the faradic tests determine the exact location of the centres. I have demonstrated this again and again to the satisfaction of Dr. Gerster and a large number of medical men present at these operations. The method is furthermore so accurate that I believe we shall be able to determine the exact subdivisions of the motor area in the brain of man as they were determined by the physiologists upon the brains of the monkey and other animals. The success of this method was particularly marked in Case II., a case of Jacksonian epilepsy with convulsive movements of the muscles about the right angle of the mouth. In Horsley's article I found an area which he claims to contain the representation of the upper face and angle of the mouth. I located this area as closely as possible upon the skull, and after trephining, on applying the faradic current to the dura, caused contraction of those muscles and of those muscles only which were, as a rule, involved in the epileptic convulsion. I need not add that the same tests applied to the cortex will give equally satisfactory results; but the chief advantage of determining these areas before opening the dura is that we may be sure that we are right before exposing any large part of the brain cortex.

While I am very certain that this method will be found entirely satisfactory in all cases of ordinary brain lesions, I have a suspicion that in cases of tumor,² or in cases in which the brain tissue has been seriously altered by disease, the morbid brain tissue may not respond as promptly to the current. In such cases the older method of determining the areas will have to be resorted to.

The first and most notable result of the operations we have recorded is that we cannot claim a single decided cure. In several of the cases there has been a marked diminution of the attacks immediately after the operation; in some the improvement lasted for a few months; but in every single case the attacks recurred after a lapse of several months or even less. The case which promises best is Case V., in which the epilepsy—characterized, by the way, by interesting auditory and olfactory auræ—was due to ear disease, and in this case the improvement that has set in has now continued nine months; but a second operation was necessary to bring about this result. The quiet of hospital life after

¹ At the meeting of this year the same doubts were still entertained by some Philadelphia colleagues. We can do no more than ask them to try and see for themselves.

² Since writing the above, the "electrical method" proved to be thoroughly satisfactory in a case of cystic tumor of the motor area.

an operation, and the unusual care which patients receive during this time, undoubtedly contribute to the cessation of attacks, and may in some way account for the successes so frequently reported, as was illustrated in Case IX. Not a single attack occurred for six weeks after operation, but as soon as the boy was dismissed from the hospital and allowed to roam about at his own free will, the attacks returned and possibly even with greater force than before.

In the first six cases reported, the operation consisted simply in opening the skull, possibly the dura also, without excision of cortical tissue. In Cases VII. and IX. cortical tissue was removed; but as far as our experience goes, excision of cortical tissue or excision of a diseased area is not superior to the older method of simple trephining. In these very cases of traumatic epilepsy it is not always an easy matter to excise the area which is supposed to be the starting-point of the epileptic disease. If the motor area happens to be the part injured, this can of course be attempted; but if, as in two of our cases, the traumatic injury caused a depression over the occipital areas, excision of the cortex, with its probably resulting disturbances of vision, would not be advisable or even fair to the patient.

If we seek for some special reason why operative procedure has accomplished so little in these cases, it is to be found in the fact that they came under our notice after the epilepsy had been established for many years. It is now generally conceded, as I pointed out in a former paper,¹ that, though a focus of disease is the actual cause of the epilepsy, this epilepsy does not manifest itself, as a rule, until widespread changes have appeared throughout the entire brain.

The time that elapses between the infliction of the initial lesion and the development of these secondary changes corresponds quite accurately with the period of time between the traumatic injury or the initial disease and the development of epilepsy.

If we operate upon cases which have run a course of many years, removal of the initial focus of disease will have little effect upon the general sclerosis that has been established. It is this general sclerosis that keeps up, as it were, the epileptic habit. The inference to be drawn from this is, that we should remove the focus of disease before secondary changes have been set up. This is equivalent to asking prompt surgical interference in all cases of traumatic injury to the skull in which there is any reason to suppose that serious harm has been done to the brain, and also in those cases in which the occurrence of a localized hemorrhage of non-traumatic origin is more than likely to give rise to epilepsy later on. The operations themselves, if skilfully done, are

¹ Sachs: "What Can We Expect from the Surgical Treatment of Epilepsy?" N. Y. Med. Journ., February, 1892.

borne so well by persons above the age of five years that a more energetic surgical treatment in the earlier stages of these troubles will be productive of great good in the way of preventing the development of epilepsy. I have not yet got beyond the point of believing that the only way to cure epilepsy is to prevent its development.

The old method of trephining for traumatic epilepsy has been so frequently recorded as productive of good that we must endeavor to find some explanation for the effects of this procedure. It will not do to classify it simply, as Dr. White does, as one of those cases in which the operation *per se* helps; I am inclined rather to believe that the frequent occurrence of cysts in traumatic cases, and also in cases of old cortical hemorrhages, accounts for the improvement following upon the release of pressure over a cystic area. The excision of cortical tissue which has been considered the only rational method in the treatment of epilepsy since Horsley first recommended it, seems to me, after all, to be of questionable merit. If the disease involved the motor area, excision of the part is apt to be followed by paralysis. This most patients are willing to bear, provided they can be promised a freedom from future attacks. In all but the most acute cases such promise can scarcely be given. Moreover, if the injury happened to involve other than motor areas, particularly if it involved the occipital or even the frontal portions of the brain, excision of any considerable cortical tissue would be in the nature of a rather dangerous experiment, inasmuch as the resulting loss of function could not well be foretold. Taking this in connection with the fact that the excision of tissue does not seem rational after the development of a general sclerosis, or gliosis as Chaslin would have it, it is evident that this "rational method" is applicable to only very few cases.

It is our intention to continue this series of operations in the hope of being able to determine those cases in which the operations promise good results. For the present I am bound to acknowledge that the prospects are rather gloomy, and that the successful cases will probably be those in which there is some very tangible organic lesion which has been removed at a very early period, or those cases in which, after traumatic injury to the skull, trephining has been done before the effect of depression of the skull upon the brain has resulted in the development of epilepsy. Considering the seriousness of epileptic disease and the slight danger attending the opening of the skull, I believe it to be the surgeon's duty, in every case in which there is the shadow of a doubt about the effect of a traumatic injury to the skull or brain, to trephine the skull and thus remove the cause of an epilepsy that would be apt to be developed.

A CASE OF TUMOR OF THE PONS IN WHICH TAPPING OF THE LATERAL VENTRICLES WAS DONE FOR THE RELIEF OF INTRA-CRANIAL PRESSURE.¹

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THE following case was referred to me by my friend, Dr. R. W. Stewart, for my opinion as to the propriety of a surgical operation. The patient was in the Mercy Hospital :

A. T., male, thirty-three years old ; born in Germany ; two years in the United States ; married seven years. He was a butcher by occupation. Enjoyed excellent health and worked regularly. No history of syphilis or intemperance. In October, 1890, while working temporarily in a rolling mill, he fell from a gondola car upon the "back of his head." The fall must have been one of considerable distance. The man, however, was not rendered unconscious by it, but, after a short rest, continued his work the same day ; nor did he lay off work for some time after this accident, but often complained of "giddiness" and muscular lassitude. He worked up to February, 1891, when, on account of his feeling of insecurity and of these subjective sensations, he gave up his occupation. At this time he was frequently troubled with occipital and occasionally by frontal headaches. His wife first noticed an unsteadiness in his gait, which was vascillating and uncertain. About the same time he began to lose some muscular power in his left arm and leg. He often lapsed into a state of semi-stupor from which he was aroused with some difficulty and into which he soon relapsed when let alone. His vision became slightly impaired. For several weeks the headaches were severe and persistent. June 14, 1891, he was admitted to the Mercy Hospital. While in the hospital he had some difficulty in micturition, and was several times catheterized. He remained in the hospital about three weeks.

In May he experienced a sudden and peculiar loss of sensation on the affected side, for which he consulted a physician in this city.

In July, 1891, he experienced for the first time some difficulty in talking and swallowing ; had occasional attacks of choking spells. All his other symptoms, especially headache and difficulty in walking, became more pronounced. He would not venture out alone, but was always accompanied by his wife. His eyesight had failed so much that he was no longer able to read. Shortly after this his headache began to be less severe and gradually disappeared altogether.

I first saw the man in March, 1892, at the Mercy Hospital, at which time the following notes were taken :

Status præsens. A well-developed, muscular man, about six feet tall.

¹ Paper read for the writer by Dr. Charles K. Mills, of Philadelphia, before the Section of Neurology of the American Medical Association, at Detroit, June 8, 1892.

² The case was briefly referred to at a meeting of the Pittsburg Academy of Medicine, when the brain was exhibited.

A careful search (the scalp was shaved) fails to reveal the presence of any scars or cicatrices; but just to the left of the median line, over the leg-centre, a small bony elevation about the size of a pea is noted. This exostosis does not fade away gradually into the surrounding bone, but is set sharply upon the bone, as though placed there from the outside. The face is distinctly drawn to the right side, there being considerable paresis of the left side. This paresis is still better seen when the patient attempts to laugh or show his teeth. There is marked paresis of both the left arm and leg, but not absolute paralysis, as the man is able to raise the leg readily and to move the arm in all directions. The muscular power in the right arm and leg and face apparently unimpaired. The power in grasp of left hand is about one-fifth that of right hand. The following measurements were taken at corresponding points on the two sides:

<i>Right side.</i>				<i>Left side.</i>			
Arm	.	.	28 cm.	Arm	.	.	28 cm.
Forearm	.	.	26 "	Forearm	.	.	25.5 "
Calf of leg	.	.	30 "	Calf of leg	.	.	30 "
Thigh	.	.	49 "	Thigh	.	.	48 "

A careful test of muscular sense shows no impairment. Patient is able to discriminate sharply between heat and cold, and also quickly feels the pain of a pin-prick. There is some impairment of tactile sense over the entire left side; on left arm can distinguish two points no nearer than 30 cm.; on the left forearm, no nearer than 15 cm.; on left thigh can distinguish at 14 cm.; over instep, 3.5 cm. Right arm distinguishes points 9 cm. distant; forearm, 9 cm.; back of hand, 2 cm.; palm, 2 cm.

Slight increase of patellar tendon reflex and ankle clonus on left side as compared with right.

A slight deafness of the left ear is noted. Can hear tick of watch no further away than five inches. Right ear normal.

Slight paresis of extra-ocular muscles. Cannot move eyes to left or upward or downward as far as in normal condition. Pupils dilated (both equally). Very little contraction to light. Patient is able to read only very large letters. Can recognize persons he knows.

His speech is very thick and muffled, but he comprehends questions, and attempts to make intelligent answers, but he cannot always be understood. Swallows with great difficulty. Food is very apt to get into larynx and provokes a coughing spell. He frequently points to his head and asks for an operation. Takes food slowly; even then often has severe coughing spells. He is unable to control his bladder, but can control his bowels.

It is difficult to estimate precisely his mental condition. While there is no very gross defect—no pronounced aberration, there is doubtless a slowness of comprehension and some loss of memory. Patient lies in bed constantly. He is unable to walk even a very short distance alone. This is probably not so much owing to his defective vision and hemiparesis as to his difficulty in coördination.

Dr. W. F. Robeson made an ophthalmoscopic examination of the eyes and found rather advanced optic atrophy, rather more marked in the left than in the right eye.

The history was gotten from the man himself and from his wife. On all the main points their statements were in accord. Both were par-

ticularly questioned as to whether the patient had ever experienced any convulsions or spasmodic twitchings. Each was sure there had been no such symptoms.

The main points in the case may be briefly summarized as follows:

A man who was previously strong and robust receives a severe injury to the head, and dates therefrom a train of grave symptoms, viz.: headache, of diffuse character generally, but at times localized, which for a period was very severe; drowsiness or tendency to lethargy, even in spite of headache; left hemiparesis; cerebellar titubation or ataxia of a certain sort; some failure of vision; difficulty in walking, which is most likely more owing to inability to coördinate than to dimness of vision or left-sided muscular weakness; marked dysphagia and aphonia; advanced optic neuritis.

These symptoms were enough to make the diagnosis of an intra-cranial lesion certain. The absence of convulsive seizures of any sort at any time; the early appearance of incoördination; the comparatively slow progress of the hemiparesis; the tendency to sleep; but more especially the marked loss of control of power over the muscles concerned in swallowing and in phonation (the bulbar symptoms)—made it seem most likely that the lesion was somewhere in the base of the brain. It seemed to me that most likely it was the pons or medulla or else at such a locality in the cerebellum that the vermiform process of the lesser brain was involved or pressed upon, as well as the pons and medulla. The symptoms of the case seemed to make this conclusion inevitable. Yet there were two features in the case which threw some element of doubt upon this diagnosis; these were the presence of the small bony exostosis referred to and the stout declaration of the patient that it was in that locality the injury occurred to his head. True, there was no scar at this place, nor could local tenderness on percussion or elevation of temperature be elicited. If the view were adopted that the lesion was at that point indicated by the exostosis it would have been impossible to have accounted for the bulbar symptoms save upon the theory of general intra-cranial pressure; and this seemed scarcely tenable because of the paresis being so distinctly one sided.

All the symptoms had progressively increased, and it seemed certain that the man would die before many weeks had passed unless some relief were afforded by surgical interference. The patient himself realized his critical condition, and was anxious to have an operation performed.

It seemed to me, in view of all the circumstances of the case, that it would be justifiable to tap the lateral ventricles to relieve the intra-cranial pressure. The plan of procedure determined upon was to trephine just to the right of the median line so as to escape the longitudinal sinus and bite enough bone away to the left as to include that part of the skull upon which was situated the bony excrescence. A search

was then to be carefully made for depressed bone, tumor, abscess, softening, blood-clot, or anything else which would be sufficient to account for the symptoms. If a morbid product were found in this situation it would be dealt with as the surgical exigencies of the case might require, and the project of tapping the ventricles would be abandoned. If the structures in this locality were found to be healthy, or if but slight disease were found, then the operation of aspirating the ventricles and inserting a drainage-tube in them would be performed.

*Operation.*¹ The operation was performed by Dr. R. W. Stewart. The patient's head having been previously shaved and prepared antiseptically, he was brought into the operating-room. Ether was administered by Dr. McCloud. Dr. Stewart was assisted by Drs. J. J. Buchanan, Pool, and the writer. Drs. J. B. Murdoch, M. R. Ward, Stoner, and others were present.

By previous measurements it was determined that the bony exostosis was situated over the superior parietal convolution. A horse-shoe flap was made. A large-sized trephine was used. The operation of trephining, as it neared completion, was proceeded with with great caution, so that the dura or the longitudinal sinus, if it happened to run a little further to the right than normal, might not be injured. The trephining was done in the place previously determined upon. When the button of bone was removed there was distinct bulging of the dura mater, which was very tense to the touch. It seemed to some of the gentlemen present that an incision through the dura would surely reveal the presence of a morbid product. The dura was then incised, after which procedure the patient was seized with a coughing spell, when a rather formidable cerebral hernia ensued; but a subsidence of the coughing was followed by a considerable subsidence of the protruding convolutions. The cortex under the pia presented a bluish, congested appearance. A careful exploration of the exposed convolutions by Dr. Stewart with his finger failed to reveal the presence of any mass of greater or less consistency than the normal brain-tissue. The opening was now enlarged to the left, by the use of the rongeur forceps, enough to include the small bony exostosis. Nothing of unusual character was found either in the conformation of that part of the internal table of the skull or of the underlying dura. The brain substance was now carefully probed in several directions by the operator, but no feeling of greater or lesser resistance was communicated to his hand through the probe. The opening was next enlarged slightly downward to the right, but nothing unusual was found. Dr. Stewart now inserted a small trocar and canula into the lateral ventricle. No difficulty was experienced by him in finding this cavity. Upon the withdrawal of the trocar a clear straw-colored stream of considerable force issued from the canula. It was estimated by Dr. Murdoch that at least two ounces escaped. The canula was then withdrawn, and a drainage tube was inserted into the ventricle through the canal made in the brain by the canula. The tube was conducted to the outside of the scalp through a hole made in the centre of the horse-shoe

¹ In the absence of my colleague, Dr. Stewart, who is in Europe, it devolves upon me to describe the operation. I regret that this is necessary, as this part of the subject must lose something of interest by this substitution.

flap. The wound was now closed, the button of bone not being replaced. But little bleeding occurred during the operation, which was conducted on the strictest antiseptic principles.

The patient came out from the influence of the ether slowly. He stood the operation badly. His temperature went up to 102° on the evening of the day of the operation. The next morning it was noted that the paresis of left side had increased. He was seized with three or four convulsions which, the nurse states, were general in character. By noon of the second day the temperature had risen to 103.5° . Up to this time, about twenty-four hours after the operation, there had been a constant discharge of clear fluid through the drainage-tube. The dressing was saturated, and the nurse was compelled to change the pillow several times. It would be impossible to estimate the amount which escaped, but it must have been several ounces. As it seemed to Dr. Stewart and myself that the drainage-tube had accomplished all the good it ever would, and that it was a likely source of irritation and cause of the rise of temperature, it was decided to withdraw it at once. This was done without any difficulty. But the patient was on the downward turn. Dyspnœa became marked; œdema of the lungs ensued, and death occurred about thirty-six hours after the operation.

Autopsy was performed about twenty-four hours after death, the head only being examined. No pus was noted about the wound. A slight union of the edges of the wound was found to have taken place. The flap was somewhat swollen and congested. There was nothing unusual of note either about the bones of the cranium or the brain membranes. The calvarium was carefully explored for an old fracture, but no trace of any could be found. The convolutions were full, regular, typical, and healthy in character. A considerable amount of fluid was found between the pia and dura. But some wrinkling of the dura was noted, evidently the result of the escape of the large amount of fluid from the drainage-tube; for while some of this fluid came from the ventricles, doubtless much of it—especially of that which leaked out while the patient was in bed—came from what was doubtless a considerable accumulation between the dura and pia. Upon removal of the brain the primary seat of the trouble at once became apparent. It was a tumor, about the size of a walnut, situated on the left side of the pons. The growth did not extend over the median line to the right, but did press upon the upper portion of the medulla. The pyramidal tract and olivary body were found pressed downward and somewhat attenuated in character by the encroachment of the tumor. To the touch the growth was hard. It presented a rather finely granulated appearance. It was very firmly incorporated with the pons and appeared to have grown from its centre. An incision into the substance of the tumor revealed the presence of a thick, creamy fluid. Nothing else was found of a morbid character.

A microscopical examination of the neoplasm, made by Dr. Pool, showed it to be a sarcoma.

The question might be asked: If the location and nature of the tumor could have been exactly determined during life, would the operation of trephining have been justifiable? If we may be guided by the high authority of Victor Horsley it was justifiable, for this brilliant operator

has trephined several times simply for the relief of intra-cranial pressure. Philip Coombs Knapp¹ has recently reported an instructive case where, in a case of tumor of the cerebellum, trephining was done for the relief of intra-cranial pressure. In Knapp's case there were, as in my own, no distinctive focal symptoms. He concluded that the growth was either in the right temporal lobe or in one of the lateral lobes of the cerebellum. On account of the uncertainty of his diagnosis, Knapp, acting upon the suggestion of Weir and the experience of Horsley, trephined over the right temporal lobe, with a view of relieving intra-cranial pressure. The autopsy showed that the tumor was in the left lobe of the cerebellum. But it seemed to me that in my case trephining alone, with puncture, would not fully accomplish the purpose of relieving intra-cranial pressure, and, being guided by the experiences of Horsley, Duncan, and Knapp, I advised, conditionally, the more radical measure of tapping the ventricles. This operation has already been done by Duncan and is advised by Knapp.

The experience is perhaps yet too limited to warrant us in drawing up conclusions. But both Knapp's case and my own were very desperate ones. In my case the operation doubtless shortened the man's life; yet he could not have lived very long at best, and his remaining days would have been full of misery and distress to himself and his family.

Whether, if trephining alone, without tapping the ventricles, had been done, the patient would have stood the operation better is, of course, a question difficult to answer. I cannot persuade myself that this procedure added much to the gravity of the operation, for the careful introduction of a small trocar into the ventricle could not have caused very great destruction of brain-matter; but the introduction of the drainage-tube added somewhat to the gravity of the operation. Possibly a more favorable result would have occurred had the drainage-tube been omitted.

In this case I should not have strongly urged the operation upon the patient; but in view of the fact that he himself, as well as his wife, was anxious for an operation, the course adopted seems to me to have been justifiable.

So far as I am able to learn, Duncan's² case and this one are the only cases on record in which tapping of the lateral ventricles was done in a case of intra-cranial growth. But Ayers, of this city, tapped the ventricles of a boy aged five, for acquired hydrocephalus, with favorable results.³ Keen has, in five cases of hydrocephalus, tapped the lateral ventricles. In one of his cases a tumor of the cerebellum was suspected. All of Keen's cases were children—the oldest being fourteen years—and

¹ Journal of Nervous and Mental Diseases, Feb., 1892.

² Philadelphia Hospital Reports, vol. i.

³ Pittsburg Medical Review, March, 1889.

all died, the one which lived longest after the operation surviving but forty-five days. This operation has been done a number of times.

In estimating the gravity of the operation of tapping the ventricles for the relief of intracranial pressure it would not be fair to group this one case with those of Keen, for in this case the intra-cranial pressure was the result of a local disease; in Keen's cases it was the result of a general brain or vascular disease. I cannot see that tapping the ventricles in cases of congenital hydrocephalus is a justifiable operation. Only with more experience will we be able to determine whether an operation such as I have here described is justifiable under like circumstances.

A CASE OF LEUKÆMIA WHICH TERMINATED FATALLY BY RETRO-PERITONEAL HEMORRHAGE.

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DEATH from hemorrhage is not an infrequent termination of leukæmia. All through the course of the disease a tendency to bleeding is often met with. In the case about to be reported the end came, not less gradually than unexpectedly, from a large retro-peritoneal hemorrhage, and, from this peculiar fact alone, it deserves to be recorded.

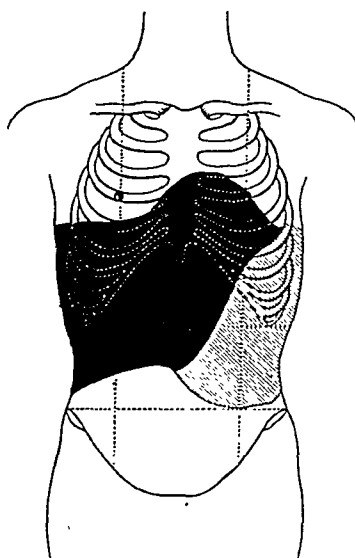
E. W., aged nineteen years, single, was admitted into the Newcastle Infirmary, under my care, on January 21st, complaining of great debility and of swelling of the abdomen of six months' duration. Her family history was good. Eight months previous to this she felt tired and wearied on the least exertion, and had complained of great thirst. She noticed, too, that she was losing flesh. Three months after this she took to bed, and has since then scarcely ever left it. About this time she was occasionally sick, and she noticed that a lump could be felt in the left side of the abdomen. It was hard, but not painful; it has not increased much, patient thinks, since then. When asked if she could explain the presence of this lump, she said she attributed it to an injury to her side. There has never been any vomiting of blood, but every three or four weeks she has had recurrences of epistaxis, which have lasted for two or three days at a time. She began to menstruate at the age of twelve, and has continued regular until twelve months ago, when the intervals lengthened, so that no menses have now been seen for at least seven months. She thinks little of this, however, as she regards the epistaxis as having replaced the menstrual flow.

Within the last few days a short troublesome cough has developed. She is emaciated. Tongue red, papillæ are prominent. There is no longer a feeling of thirst. Bowels are regular. Many of the glands in the right side of the neck are enlarged, but are not painful. Here and there upon her limbs can be felt subcutaneous nodules, the size of a

small bean; they are painless, are not discolored, and come and go in crops, each crop remaining out for two or three days. Pupils are slightly dilated. Since the commencement of the illness patient has become rather deaf. Chest: Intercostal spaces are wide and deeply grooved, mammæ are ill-developed. Heart: Apex is felt beating about one inch below and just internal to left nipple. The sounds of the heart are healthy, the second aortic being particularly well marked. Lungs: The breath sounds are coarse over each apex, but the expiratory murmur is not prolonged.

The abdomen is somewhat tense and resistant, and the superficial veins are much distended. There is a very apparent fulness over the hepatic area, the upper margin of which begins at the level of the fifth rib, and is carried down to the level of the umbilicus. Over the epigastric and splenic areas the resistance is great, and there is felt a hard dense mass, with a well-defined border projecting toward the umbilicus.

FIG. 1.



Case of E. W., showing increased areas of hepatic and splenic dulness.

The lower border is particularly well defined and sharp. The fingers can be pushed well under this, and it is noticed that on deep inspiration the dulness on the left side extends from the sixth rib to one and one-half inches above the crest of the ilium. The mass is not painful on pressure; it is perfectly smooth on the surface. There is no albumin in the urine and no sugar. Its specific gravity is 1020, and it is acid. Temperature is normal. Pulse, which is very compressible, is always rapid—116 per minute. Blood: A prick of the finger by a needle is not quickly followed by the presence of blood, but when it does come it is seen to be pale and watery. Under the microscope the field seems to be occupied almost entirely by colorless cells, which vary in size, many being larger whilst others are smaller than ordinary leucocytes, extremely granular and showing a large nucleus. Between these cells are noticed here and there dirty reddish-yellow masses, evidently composed of fused red blood-cells. No rouleaux are observed. Gowers' hemo-

cytometer showed that in 1 c.mm. of blood 1,610,000 cells were present; of these the red cells formed 980,000, and the colorless corpuscles 630,000. Patient was put upon arsenic. Under this line of treatment she improved. All seemed to be going on well with her when she unexpectedly died.

The day before her death she complained of severe pain running down her right thigh, chiefly along the course of the sciatic nerve. The pain, of which at this stage no explanation could be found, was evidently very severe. It had been somewhat relieved by an application of aconite and menthol before I saw her, and the relief continued more or less during the whole of the day. Toward evening pain returned in the leg with increasing severity, and remained constant. Vomiting now occurred, and it was noticed that the swelling in the right half of the abdomen had gradually increased in size since the morning, chiefly in a downward direction, and that it was tense and very painful. Death came quietly and without convulsions.

Autopsy. Abdomen: on reflecting the skin there was brought into view a very large spleen; it extended well toward the middle line, and was seven or eight times the size of the normal organ. After removing it there was more completely brought into view a large cyst, with dark bluish-black walls, which lay in the right half of the abdomen, extending from beneath the liver to nearly the brim of the pelvis. The intestines were displaced by it, portions of the bowel being driven deeply into the pelvis. The ileo-cæcum was pushed upward, and there was matting between it and the omentum. On clearing away the intestines this cyst was found to be the size of a man's head, and its walls were formed by the retro-peritoneum. The cyst was completely filled by thin reddish semi-coagulated blood of a peculiarly flaky color. It was not connected with the liver, although it could be traced up under this organ to near the diaphragm. From this point it extended all the way down to the brim of the pelvis, but on approaching it the cyst became narrowed and not nearly so distinct. The right kidney was pushed upward, forward, and to the left, and was apparently in no way connected with it. The anterior wall was composed entirely of retro-peritoneum. At the right side the peritoneum all at once glanced off from its parietal attachment to encircle the tumor in front, and then passed down more or less behind it, on the left. It was as impossible to remove this blood-cyst as it was impossible to make out with which vessel or vessels it was connected. It is sufficient to say that it was not connected with liver, kidneys, or adrenals, nor with anything in the pelvis. The uterus, ovaries, and bladder were healthy and free from any adhesions. The kidneys were normal. Liver seemed healthy. Gall-bladder contained healthy-looking bile. The spleen, as already stated, was enlarged. On its anterior surface was a thick white patch, the size of the palm of the hand, and about one-eighth inch in depth. It was firm, and on section its tissue was coarse-looking, and showed pale trabeculæ. The heart was extremely firm and hard to the touch; it was a little larger than the normal. The left ventricle was hypertrophied, its wall being nearly one inch thick, whilst its cavity was not dilated. This cavity contained a large quantity of flaky blood. The other chambers of the heart contained large quantities of the same kind of blood, and were healthy. Lungs presented nothing remarkable. Pericardium and pleuræ were healthy.

This patient, whilst possessing a large spleen and suffering from leukæmia, died from the effects of an internal hemorrhage; the blood forcing its way behind the retro-peritoneum on the right side, throwing it forward, and giving rise to a blood-cyst.

Going back upon this case of leukæmia, it is difficult to account for it. There is mention of an injury to the patient's side from a fall against a doorway, a circumstance which should not be forgotten, since De Chapelle has shown what an important part injury plays in the causation of this disease. Epistaxis, too, was an early and an important symptom in her case, and its monthly recurrence may have had something to do with the abolition of the menstrual function, which up till that time had been normal.

It is difficult to explain the deafness. Is there any reason to suppose that an internal or labyrinthine hemorrhage had occurred—an accident to which has been ascribed the loss of hearing in leukæmia? It is well known that deafness is frequently met with in leukæmia—so frequently, in fact, that it cannot be a coincidence. Vidal and Izambert found it present in 10 per cent.—a percentage which Gradenigo, of Padua, who has given considerable attention to this subject, regards as too high. In Gradenigo's case—one of mixed leukæmia—hearing was affected in both ears, and there was tinnitus aurium, which was relieved by catheterization of the right Eustachian tube. Epistaxis, too, was not less an obstinate than a prominent symptom. Death occurred in six weeks—preceded by a recurrence of hemorrhagic diarrhœa. At the post-mortem there was found a gelatinous yellowish-red substance in the drum-cavities, extending backward toward the mastoid cells. The fluid pressed from this mass showed under the microscope red and white blood-cells. There was found newly-formed connective tissue, with hemorrhagic infiltration. Gradenigo, therefore, believes that in the course of a leukæmic process there sometimes occurs in the organ of hearing complications which depend upon exudative processes in the middle and internal ear, and this quite independently of anything like a hemorrhagic diathesis. This extract from the *Internat. Journ. Med. Sciences*, 1887, conveys the opinion of most writers upon this subject. In some cases the deafness has been found to have been due to labyrinthine disease. The tendency has been, however, in nearly all of them, for hemorrhage to occur into some of the deeper parts of the auditory apparatus. At the post-mortem of my case we were not allowed to examine the head, so I cannot express more than a theoretical opinion upon this point.

The condition of the blood is interesting. The total number of corpuscles in 1 c.mm. was only 1,610,000—and of these 98,000 were red cells, and the remaining 63,000 were colorless. Pepper (*Syst. Med.*, vol. iii. p. 912) considers it rather the exception for the number of blood-cells to fall below 2,000,000 per c.mm. I have seen the number even lower than this. In one case, that of a woman near the middle term of life,

only 540,000 cells, red and white, were present in 1 c.mm. of blood. But to return; given the normal relationship of 1 white blood-cell to 400 red in 1 c.mm. of blood, we have in the present case the two kinds of cells almost equal—the relationship being one white to one and one-half red. It is, therefore, a veritable leucocytosis that we have, and about it I would incidentally make this remark, viz.: that if we, in these cases,

FIG. 2.



Spleen with thickened capsule, showing development of new vessels.

FIG. 3.



Spleen: subcapsular tissue. Showing dilated bloodvessels with thin walls, and filled mostly with colorless cells.

were to form an opinion as to the condition of the blood from an examination of the patient's face and lips alone, we would completely fail to realize to what an extent the blood had become morbidly altered. In other words, there may be not only a marked diminution in the number of cells as a whole in the blood, but the most pronounced leuco-

cytosis may be present, and yet almost no indication of this will be revealed in the face or lips of the patient. Occasionally the lips of the invalid may be well colored—not in any way even suggesting anæmia; and when the blood is examined under the microscope there is found not only a diminution of red cells, but almost an equal number of colored and colorless corpuscles.

Without going into the morbid anatomy of leukæmia, I would simply allude to the great thickening of the capsule that is frequently met with in leukæmia—drawings of which are subjoined.

Sims Woodhead, in his *Practical Pathology*, 1892 ed., p. 431, alludes to this irregular thickening of the capsule of the spleen, "under which there are at times purple patches, the result of hemorrhage." Examination of the drawings shows not only a thickened capsule, made up of an excessive development of fibrous tissue, but a rich network of blood-vessels, the walls of which are extremely thin, and therefore liable to rupture. Large blood-sinuses, too, are noticed in the splenic pulp immediately under the capsule. The one morbid feature which is characteristic of leukæmia is the irregular accumulation of leucocytes in patches in and around the small bloodvessels in spleen, liver, and subserous spaces; it is thus easy for embolic hemorrhages to occur. Numerous small hemorrhages may thus at first have taken place underneath the retro-peritoneum of E. W., and been the precursor of that large hemorrhage which caused death.

Disseminated capillary hemorrhages in leukæmia were observed by Byrom Bramwell (*Brit. Med. Journ.*, June 12, 1886) in brain-tissue, associated with hemorrhages of varying size—some as large as a hen's egg, others only visible to the naked eye. In his case the bloodvessels and capillaries throughout the brain were enormously dilated and distended with white corpuscles, multitudes of which had escaped into the lymphatic sheaths surrounding the larger vessels. The hemorrhages were composed for the most part of white corpuscles, and it is to the presence of these cells in excess that I attribute the peculiar flaky condition of the blood in the retro-peritoneal hemorrhage in my own case.

Of late the infective nature of leukæmia has attracted the attention and received the support of Pawlowsky (*Deutsche med. Wochenschr.*, July 7, 1892, and alluded to in *Supplem. Brit. Med. Journ.*, Aug. 13, 1892), in whose case—one of considerable leucocytosis (1:4) and enlargement of the spleen—there were found in the blood short bacilli with spores. In the blood and organs of five other patients similar bacilli had been found, as well as in the blood of leeches which had abstracted blood from leukæmic patients. The presence of these microorganisms in the blood of six patients led Pawlowsky to regard them as peculiar to leukæmia, and standing in direct relation to it. Whether subsequent examinations by other bacteriologists will confirm his observations remains to be seen—for, relying upon these facts, Pawlowsky has come to regard

leukæmia, as a disease of the blood. The bacilli are considered to exercise a certain influence upon the leucocytes in the blood-forming organs. These cells multiply, many of them entering into the blood in an imperfectly formed condition. Carried all through the system by the blood, the microorganisms are retained in the spleen, lymphatic glands, and medulla of bone. In the spleen is supposed to occur the fight between leucocytes and microbes (phagocytosis). How far this is purely hypothetical remains to be seen before there can be general acceptance of Pawlowsky's opinion that the hyperplasia of the spleen and other blood-forming organs is the result of the reaction of the individual against the poison circulating in the blood.

THREE CASES OF A HITHERTO UNCLASSIFIED AFFECTION RESEMBLING IN ITS GROSSER ASPECTS OBESITY, BUT ASSOCIATED WITH SPECIAL NERVOUS SYMPTOMS— ADIPOSIS DOLOROSA.¹

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At the meeting of the American Neurological Association held in Washington in September, 1888, the writer reported an anomalous case found in the nervous wards of the Philadelphia Hospital, and as it was not possible to classify the condition found, the description was prefaced by the title, "A Subcutaneous Connective-tissue Dystrophy of the Arms and Back associated with Symptoms resembling Myxœdema." Subsequently the case was published in the *University Medical Magazine* for December, 1888.

Some two years later, another and apparently similar case was discovered in the medical wards of the Philadelphia Hospital, and was reported at a meeting of the Philadelphia Neurological Society in December, 1890, by Dr. Frederick P. Henry. It was described as a case of myxœdematoid dystrophy and afterward published in the *Journal of Nervous and Mental Disease* for March, 1891. Dr. Henry stated that he adopted the term dystrophy in order to bring the case "into the same category with the very similar one" reported by the writer.

In October, 1891, a third case, resembling the others, made its appearance in the nervous wards of Blockley. This will presently be detailed, but before doing so let us review, as briefly as possible, the previous cases, in order that all three may be considered together.

¹ Read before the meeting of the American Neurological Association, New York, June, 1892.

CASE I.—Before described by the writer, as stated, in 1888. History in abstract as follows :

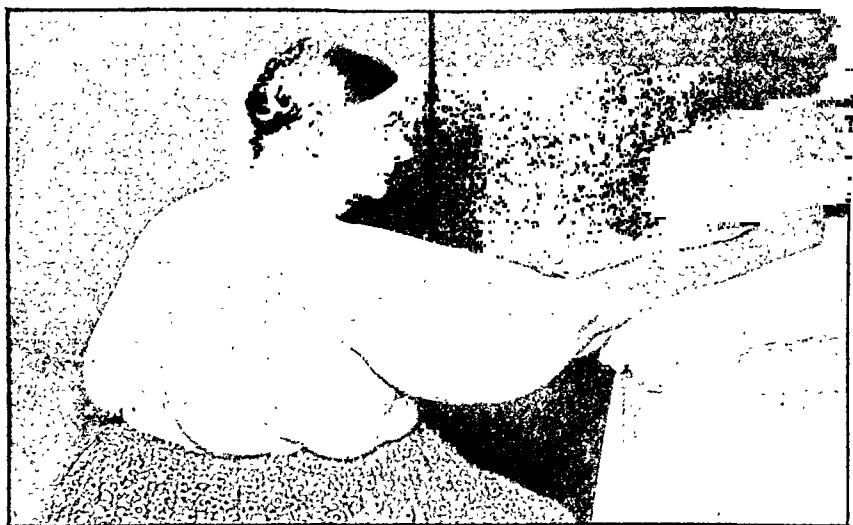
M. G., aged fifty-one, female, widow, native of Ireland, domestic.

Family history. Father died at forty-five, of erysipelas. Mother had eighteen children ; died at forty from some complication incident to the menopause. Of brothers and sisters, seven died in early childhood, one

FIG. 1. (CASE I.)



FIG. 2. (CASE I.)



in adult life, of pleurisy ; a sister, in childbirth ; a brother and two sisters, of phthisis ; while the remaining five are living and apparently in average health. None of the patient's relatives had ever suffered, as far as she knew, from symptoms similar to her own. No history of insanity, epilepsy, or other neurosis.

Personal history. As a child, had measles, whooping cough, and scarlet fever. Menstruated normally at fifteen. Married at eighteen. Some years after, had an attack of pneumonia but made a good recovery.

Had in all seven children and one miscarriage. Five children died in infancy or childhood, one from cholera infantum, two from measles, one from "congestion of the brain," and the fifth from "spasms." Menopause set in abruptly at thirty-five. From this time up to within two or three years her health had continued good. She had undergone some increase in weight, but beyond this nothing worthy of mention could be recalled. Syphilis and alcoholism denied.

When forty-eight or forty-nine years of age noticed that her arms were becoming very large. The upper arms and shoulders appeared swollen. On some days the swelling seemed more decided than on others. It continued steadily to increase, and for about a year was unattended by any other symptom.

In November, 1886, she was admitted to the surgical wards of the Philadelphia Hospital for the rupture of a varicose vein of the leg. In the following February she was transferred to the medical wards for a severe attack of bronchitis. Later she had an attack of severe pain and swelling in the right knee, attended by chill and fever. She was treated for rheumatism and promptly relieved. Two weeks after this she complained of a sharp darting pain in the right arm. It began on the outer aspect above the elbow, and gradually increased in severity and extent, spreading upward to the shoulder and neck and downward to the forearm and hand. It was different, she states, from the pain previously experienced in the knee. It was shooting and burning. She felt at times as though hot water were being poured upon the arm, and again as though the hand and fingers were being torn apart. No rise in temperature was noted. The pain was often paroxysmal, being very much worse for hours and days at a time, but even during the intervals it was never altogether absent. On June 4, 1887, she was removed to the nervous wards, when she came under the writer's care.

Her appearance at this time was striking. She was a tall, large-framed woman who looked as though she had at one time presented a fine physical development, but she seemed unnaturally broad across the back and shoulders. On removing the clothing an enormous enlargement of these parts was disclosed. The enlargement affected both shoulders, the arms, the back, and the sides of the chest. It was most marked in the upper arms and back, forming there huge and somewhat pendulous masses. It was elastic, and yet comparatively firm to the touch, and it was impossible to produce pitting. In some situations it felt as though finely lobulated, and in others, especially on the insides of the arms, as though the flesh were filled with bundles of worms. The sensation to the fingers was very much like that experienced in examining a varicocele, except that the structures appeared more resistant. The skin itself was evidently not thickened. It did not take any part in the swelling and it was not adherent to the subjacent tissues. It was slightly roughened over the forearms, less so on the arms, shoulders, and hands, while over the fingers it was quite smooth and even glistening. Further, over the forearms and hands it was slightly darkened, small brownish patches and minute epithelial scales being observed; lastly, it was quite dry.

The right arm was extremely painful on motion. The head, at this time, was also held in a fixed position for fear that movement of the neck would give rise to pain in the shoulder. In addition, the arm was also very sensitive to pressure. Pronounced pressure appeared to be absolutely unbearable. The nerve trunks also were exquisitely sensi-

tive, but this painful condition was not by any means limited to them, but permeated the swollen tissues as a whole.

In marked contrast to the right, the left arm could be handled with impunity. Transient pain was, however, at one time noted in the left wrist.

The muscles were evidently not involved in the swelling. On grasping, for instance, the enlargement over the left biceps and directing the patient to flex and extend the arm repeatedly, the mass was felt to be unaffected by the movements of the underlying muscle. The affected parts were, however, quite weak. The grip of the right hand was almost nil, while that of the left was greatly diminished. Examined electrically, the muscles of the shoulders and arms yielded a negative result, partly because of the great resistance caused by the intervening tissue. Slight quantitative and qualitative changes were noted in the muscles of the forearms, while in the hands distinct reaction of degeneration was noted in the thenar and hypthenar groups, more evident on the right side.

Cutaneous sensibility was much diminished. On the right arm various areas existed in which no response whatever was given to the æsthesiometer. They were large and irregular in shape and very sharply defined, and were present on both the inner and outer aspects. In the finger-tips of the same side the points could not be at all separated. In the left arm, on the other hand, the response was prompt and accurate, except on the outer aspect of the forearm, where some delay and uncertainty existed. In the finger-tips, also, sensation was decidedly below normal, the points being separated at not less than one-half or three-quarters of an inch. Sensibility to heat and cold was also diminished.

Examining the legs, it was found that cutaneous sensibility was distinctly lessened on the right, while showing little or no impairment on the left. No enlargement was, however, noted at this time in any portion of the body, save in the regions already mentioned. No swelling or anæsthesia was found about the face. The latter was pale, as were also the mucous membranes. There was, however, a little color in the cheeks, more noticeable at times. Her features were well formed and intelligent. Her hair was dark and fine, and somewhat thin over the vertex. Her mind was unimpaired, except that at times she was much abstracted. Sometimes she gave conflicting answers to questions, so that the latter had often to be repeated. Her speech was not slowed or otherwise altered. At times she was irritable and quarrelsome, and frequently gave much trouble to her nurses.

The above abstract fairly represents her condition at the time of her admission to the nervous wards.

June 13th, ten days later, she had a chill, followed by fever and a painful herpetic eruption over the upper portion of the left arm and the upper and anterior portion of the left side of the chest. June 19th, another crop of vesicles made its appearance on the back and on the front of the chest.

For some three months following, among other studies, a careful record of the axillary temperature was made. It proved to be very nearly normal. At one time, however, a temperature of only 97° was recorded.

Nothing worthy of note occurred until October 13th, when the patient had another severe attack of bronchitis, which was accompanied by much dyspnoea.

In the latter part of December it was noticed that during one of her paroxysms of pain the swelling of the right arm became more decidedly lobulated. The arm became more sensitive than ever, and on examina-

tion hard, cake-like masses were felt, resembling, as the resident physician expressed it, the caking of milk in a breast. This caking, or increased lobulated feel, was subsequently repeatedly noticed during paroxysms of pain. At this time, also, she suffered from an attack of pain in the right knee, and in the popliteal space a diffused swelling was felt which exhibited the same curious nodulated or leech-like feel as did the swelling elsewhere. It was also very painful, but subsided in a few days, and no permanent alteration of the tissues could be detected.

At various times subsequently paroxysms recurred, during one of which swelling was noticed in the posterior triangles of the neck, which seemed later to be permanently fuller than normal. Bronchitis also recurred, accompanied by dyspnoea, and at one time with free expectoration of bloody mucous.

In April following she experienced an attack of unusual severity. The pain, which involved the right arm and shoulder, right side of trunk and back of neck, now for the first time spread to the face and head. The right side of the face and neck became distinctly swollen, and presented to the touch the same nodulated feel so characteristic of the swelling in other portions. At the same time, the tongue and probably the pharyngeal tissues became swollen. Her tongue, she said, felt much too large for her mouth, and this certainly appeared to be the case. Her speech was much interfered with. Her voice was very hoarse, and she spoke with great difficulty. This condition persisted for upward of a week, when the swelling slowly subsided. For some time subsequently she spat blood, the source of which was not determined, though it appeared to come from the throat. The reddish color in the cheeks also became more pronounced, until it covered the entire forehead like an intense blush. This blush was afterward observed to recur with other paroxysms of pain.

During the summer of 1888 the patient's condition underwent some change. The paroxysms of pain became less frequent and less severe. Hand-in-hand with this improvement, sweating became very abundant. However, paroxysms accompanied with marked dryness of skin occurred from time to time, and upon one occasion a thick, welt-like swelling, exquisitely painful, was observed extending from the upper and inner angle of the scapula perpendicularly down the back to very nearly the lumbar region. Upon another time, swelling again made its appearance in the right popliteal space, as well as on the inner aspect of the knee. In the latter locality the swelling became permanent and the tissue presented the same peculiarities as noted elsewhere.

Pain now occasionally appeared in the left arm. Prolonged attacks of cardiac dyspnoea recurred every week or two, and apparently independently of bronchitis.

Examination of the eyes by Dr. de Schweinitz revealed contraction of the fields of vision for form and colors, most marked in left eye. The other special senses, hearing, taste, and smell appeared to be somewhat obtunded.

An analysis of the urine yielded a negative result. A blood-count failed to reveal an increase of white corpuscles.

Since the notes from which the above account is condensed were taken, the patient has at various times during attacks of pain vomited blood. Upon several occasions this was observed by the writer himself. The quantity could not be accurately estimated, but while it was never in large bulk at a single emesis it was constantly brought up in repeated

vomiting during an entire night or day. The last attack occurred in August, 1891.

Measurements were made of this patient at various times, and there has been a steady increase in the bulk of the arms up to the present time.

As a whole, however, the patient has not suffered as intense pain as formerly. Cardiac dyspnoea, though, is a frequent and very distressing symptom. Pulse soft and rather rapid, ranging from 95 to 110. Face still flushed. Of late has had shooting pains in the abdomen, and examination discloses an extensive deposit of tissue in this region, and to which the pain is referred. A large longitudinal wheal, especially sensitive, is found in the left lumbar region.

A deposit of tissue (or swelling) has also made its appearance over the left hip and to some extent over the right. Thighs and buttocks do not seem to be especially enlarged, but soft masses are now found on the inner sides of both knees, the right larger than the left, the former more painful to pressure.

A small nodule to the right of the scrobiculus is especially painful.

At various times, by means of a Duchenne trocar, fragments for microscopic examination were removed from either arm. They revealed connective tissue and fat cells present in varying degree. It was observed that the former was decidedly embryonal in type, the cells being large and fusiform, and their nuclei correspondingly large and prominent. The fat-cells for the most part were associated with these connective-tissue cells, and occasionally individual fat-cells were seen in which the fatty metamorphosis had not been complete. (In one of the fragments removed the writer was fortunate enough to find nerve elements which had probably been included in the grasp of the trocar by the latter grazing a bloodvessel, as the fibres were non-medullated. Their connective tissue was denser than normal and they presented an unusual number of nuclei.) For a detailed description, with drawings, the reader is referred to the original article (*loc. cit.*).

CASE II.—This, as already stated, was reported Dr. F. P. Henry (*loc. cit.*). Subsequently in November, 1891, she came under the care of the writer, having been transferred to the nervous wards, where she finally died about a month later. The following account is abstracted partly from the report of Dr. Henry and partly from my own notes.

E. W., aged sixty-four, married, native of England.

Family history. Father dead of alcoholism at middle life. Mother dead at twenty-eight of oedema of brain, verified post-mortem. Has living an elder brother and sister and one younger brother. The younger brother when a child was "peculiar"—he would run to people in sudden fright and say that he was drowning or the like. He is now in average health, but drinks heavily. Has a contracture of the ring finger. Has nine children, all of whom appear to be well. The older brother suffers periodically from violent headache; also, since a young man has suffered from constantly cold feet—this so severe as to disturb sleep and cause great distress. He had five sons and two daughters. One son died of tetanus (traumatic); the others are well. One daughter has a contracted middle finger of the right hand; has never suffered pain in the finger. Patient's sister is living, sixty-five years old, and healthy; no children.

Previous history. Does not remember having the ordinary diseases of childhood. At early infancy began to have fits, which at times occurred daily, at other times weekly. Consciousness was lost during the fits, and they were followed by great pain in the forehead. After the seizures she

slept. During this time was relieved of lumbricoid worms—vomiting them; and some time later recovered from the fits.

Was married at seventeen. Had two sons, the older of whom is now forty and has seven healthy children; the younger died at two years of

FIG. 3. (CASE II.)



FIG. 4. (CASE II.)



hemorrhagic diarrhoea. Patient had no miscarriages and no stillbirths. Left her husband because of a venereal disease contracted by the latter. Was told by a doctor that she had escaped infection. A year later,

however, she had sore-throat with white patches. Had been an immoderate drinker for many years. For weeks at a time was intoxicated every night.

Menstruation began at eleven and ceased abruptly at thirty-five. Lost habitually an unusual quantity of blood, but never suffered any discomfort.

History of present disease. Her malady began about fifteen years ago, when she was forty-nine years old. At that time she was living in California. The first thing noticed was a constant feeling of coldness about the knees, followed by swelling, which gradually increased. At first she thought the swelling was due to her growing fat, but later was astonished to see that there was a localized mass on the inner aspect of each knee. At the same time there was dull aching pain in the affected parts. Later the right arm became involved, a mass making its appearance on the outer aspect. Her body she now noticed also became larger, as her stays were too small for her. During this time, while still in California, her inability to perspire, except at the Turkish bath, was marked and was part of her reason for coming East. Since she has been in Philadelphia the lack of perspiration has not been as marked as before. Various plans of treatment were tried, but did not influence the progress of the disease (that is the growth of the swelling). Five or six years ago injections of chloroform were made into the swellings on the inner side of the knees, but no good was done. Painful ulcerations were the result, and scars of considerable size mark their location,

About five years since a slight swelling appeared in the epigastrium. This gradually increased in size until it resembled the breasts in shape. and afterward spread so as to involve nearly the whole abdomen.

From the knees the process extended to the thighs, and gave rise to the large masses on their outer side and about the hips.

To Dr. Henry she stated that pain had never been a well-marked feature of the disease, which differed, however, from her statements made to the writer. To both, however, she stated that at various times she had suffered with pains apparently situated in the enlarged tissues or running down the limbs. Sometimes these attacks were fairly well localized, in one limb, in one side, or about a joint.

Five years ago her attention was called to a peculiar condition of the right hand. The last phalanx of the second finger began to be fixed in a flexed position, while the end of the finger appeared to be growing somewhat smaller. Later the remaining fingers of this hand became involved and all the phalanges deformed. The deformity as seen now is flexion of first phalanx, marked over-extension of second, and half-flexion of the third. The thumb is also stiff, but all of its joints are flexed. For some time she has noticed the thumb of the left hand becoming like that of the right.

A year ago the patient had a quasi-rheumatic attack affecting the deformed hand and the arm. The pains seemed to run up and down in the arm rather than about the joints.

Some months ago had pneumonia of the right lung, and made a good recovery.

For several months past had slight uterine hemorrhage at times, associated with which were dull, aching pains, resembling those formerly felt before menstruation.

On November 27, 1891, she was transferred, as already stated, to the nervous wards. Here, on questioning her in detail, I was able to con-

firm the points of the history, as described by Dr. Henry. In addition, she said that the enlargement had spread from the knees to the thighs and buttocks unequally, that the left thigh and buttock had been earlier and more conspicuously enlarged than the corresponding parts on the right side. Gradually, however, the latter became enlarged to an almost equal degree. Later, swelling appeared over the left arm, and later still on the back and sides of the trunk, and wherever appearing it gradually became diffused and finally reached very great proportions. The patient further volunteered the statement that she had formerly been very slight in build.

To ordinary observation she merely presented the appearance of an excessively obese person. However, examination soon revealed that the enlarged tissue was very unevenly distributed. In the region of the knees, where it had first made its appearance, it was excessively irregular and lumpy. To the fingers it resembled, in a remarkable degree, the swollen tissues of Case I. It gave the same nodular and elastic feel, and could not be made to pit on pressure. At the time of the examination no tenderness existed in any of the lumps, but shooting pains were referred to them in various situations. This was particularly the case in the mass over the right hypochondrium. In addition, she complained of scalding sensations on the inside of the right cheek and the right side of tongue. Nothing abnormal could be discovered in the mucous membrane of these parts. No tenderness existed in any of the nerve-trunks at the time of the examination. The patient was excessively weak, and could move about her bed or sit up only with great difficulty. Her grip was almost *nil*. No tendon jerks could be elicited—probably due to purely mechanical difficulties. For the same reason, an electrical examination could not be made.

Examination of the cutaneous sensibility confirmed, in general, the findings of Dr. Henry, except that some areas had become entirely anæsthetic. Dr. Henry found that there was slight analgesia, and diminished temperature and tactile sense, and further that the "changes of sensory acuteness were not more marked over the distribution of any of the cutaneous nerves, but seemed dependent entirely upon the amount of the subcutaneous tissue." Dr. Henry, it appears, found no area of absolute anæsthesia anywhere. However a year later, such an area undoubtedly existed on the back of the left arm, and extended thence over the posterior aspect of the left shoulder. On the opposite side, anæsthesia was not present, although no marked difference, if any, existed in the amount of the subcutaneous tissue. A marked increase in this subcutaneous tissue had, however, everywhere taken place during the past year. Comparing, for instance, the measurements of the arms made by Dr. Henry and myself, it was found that the left forearm had increased one and seven-eighths inches, and the right forearm one and three-eighths inches; the left arm one and a half, and the right arm two inches. This increase seemed to be maintained throughout.

Subjectively, the patient complained much of headache. Her face was very much flushed, and she suffered greatly from cardiac dyspnœa. It was a persistent and distressing symptom.

Examination of the eyes proved negative, as did also that of the urine. Perspiration, according to the patient's statement, was scant. Face not involved in the enlargement. No subnormal temperature. Hair thin, but not excessively so. No difficulty in speech. No mental impairment.

deposits give unnatural prominence to either hip. In marked contrast, the deposit is absent from the forearms and hands, from the face, from the thighs and legs and from the buttocks. The gluteal regions, in fact, seem flattened and sloping.

The deposit at the back of the neck and over the abdomen seemed tolerably firm and resistant; over other portions it was quite soft, though elastic, and exhibited the same nodular feel noted in the previous cases. Further, it was discovered at once that these masses were painful to the touch, the patient complaining very much when only moderate pressure was exercised. This was especially true of the deposits over the arms and back of the neck. In addition, the patient complained of stabbing pains in the deposits, more marked in the regions just mentioned. There was no tenderness over the nerve-trunks. She complained also of headache.

In making the examination, it was also further noted that the left radius was rough and nodular for about two and a half inches in its middle third; also, that there was a large discolored area on the outer aspect of the left forearm resembling a syphilitic scar. Both tibiae were somewhat nodular, though no scars were discovered on the legs. A few white scars were seen on the forehead. Quite a number of purpuric spots were also observed on the forearms, thighs, legs, and back.

The skin of the forearms and hands, and that of the legs and feet to a less extent, was dark, dry, and much roughened.

Cutaneous sensibility was found generally diminished, while a few patches of anaesthesia were noted. One of these was an area diffused over the right side of the trunk and the right shoulder. They appeared to be constant, and were confirmed at various examinations.

Owing to the extreme weakness of the patient, the study of the eyes could not be made satisfactorily, but, as far as it went, was negative.

The urine contained albumin. No casts were found.

In answer to questions, the patient said that she had not been sweating freely for years, but owing to her mental condition no importance was given to this statement. She at no time presented a subnormal temperature. Her hair was well preserved.

Patient seemed to fail gradually, although diet and stimulants were freely used. Her dementia gradually deepened, and for some days before death she voided urine and feces involuntarily. She finally died in a comatose state on November 5th.

Autopsy, November 6, 1891. Body of a large woman with irregularly distributed fat-like masses. Some discoloration of the back. Small bed-sores beginning on the buttocks.

Scalp and calvarium normal. Dura normal. Pia very oedematous. Brain very soft and oedematous. Cord revealed nothing abnormal.

On incising the skin of the chest and abdomen it was found to be normal in appearance, but the subcutaneous tissue, which looked like a very white fat, was excessively thick, reaching below the umbilicus a depth of seven inches.

The thyroid gland was larger than normal, harder to the feel, and much calcified, especially the right lobe.

The heart weighed eight and a half ounces. Both aortic and mitral valves were slightly thickened. Heart substance evidently fatty. The lungs were emphysematous. The mucous membranes of the stomach revealed a chronic gastritis. The liver weighed forty-four ounces, and

beyond some fatty infiltration, was practically normal. Spleen normal. The kidneys, however, showed decided shrinking and loss of cortical substance, with somewhat adherent capsules. Nothing noteworthy in pelvic organs.

As in Case II., brain, cord, nerve-trunks, skin and subcutaneous tissue, thyroid gland, and portions of other viscera were removed for microscopic examination, with the subsequent unfortunate loss of the specimens already mentioned.

It is not without some hesitation that I bring these cases before you. I am well aware that without a microscopic examination to supplement the autopsies their study is incomplete, and yet the cases are in themselves so interesting, and appear to be so unusual, that their publication in a group with such data as are at hand is more than warranted. Certainly these cases differ radically from ordinary cases of lipomatosis, and certainly the nervous symptoms present are not without a special significance. To begin, the enlarged tissue makes its appearance in a very irregular way. Nodules of soft tissue are, at first, deposited in some one situation, or perhaps in corresponding places of the upper or lower extremities. For a time the deposit is limited to these original areas, but subsequently it makes its appearance elsewhere, and may become very extensive. Regions, however, may exist which remain permanently uninvaded. In Case I. the enlargement was first noticed in both upper arms, and later in the back. Subsequently swelling made its appearance on the inner aspect of the right knee, to be followed months after by a similar swelling in a corresponding position over the left knee. Later still, it made its appearance in various other situations. However, the legs, with the exception of the knees, have remained free from involvement, while the thighs and buttocks have only recently shown a doubtful change. In Case II. the enlargement began on the inner aspect of either knee, and then gradually spread unequally over the thighs and buttocks. Later, the left arm became involved; next the sides and back, and finally the entire trunk. In Case III. the enlargement began in the back of the neck, and thence at various times in other situations. It remained absent from the face, the forearms, the legs, thighs, and buttocks. It is a peculiarity of this case, further, that the enlargement tended to produce distinct segregated masses.

Not only is the development of the enlargement irregular and even capricious in these cases, but there is, in addition, another important fact to be remembered, and that is: that at some time or other the enlargement is accompanied by pain or other nervous symptom. Thus, in Case II., pain and a sensation of cold preceded the appearance of the nodules on the inside of the knees. In Case I. pain was noticed a year after the swelling of the upper areas had begun to show itself, and in Case III. pain was evidently present at the time of the examinations.

In Case I., again, which I had the opportunity of studying in great detail, pain was observed at numerous times. Occasionally it was observed in old areas of enlargement, and again in regions free from the latter, but in which it subsequently appeared. This was especially the case in the swelling on the inner aspect of the right knee and certain welt-like formations in the back. Finally, pains, shooting or stabbing in character, were present in all cases, both at various times in the history and at the examinations. Very suggestive, indeed, were some of the paroxysms of pain observed in Case I. In some of them decided and sudden increase took place in the swelling of a part attacked, and it became, for the time being, firmer and more resistant, and occasionally more nodulated than before. Further, as already pointed out, a permanent increase or a new focus of swelling made its appearance. It should be remembered, too, that some of the nerve-trunks, especially those of the right arm, were very sensitive to pressure; that some of the muscles—*e. g.*, the thenar and hypothenar groups—revealed reaction of degeneration, and, more significant than all, that the patient suffered on two occasions from herpes zoster.

In Cases II. and III. tenderness over the nerve-trunks could not be elicited. However, in Case I. this symptom has at present disappeared. Indeed its absence has been noted for some time past. This circumstance leads to the suspicion that Cases II. and III. were further advanced than Case I., and that the latter was really observed during a developmental period and whilst more active changes were going on.

Among the nervous symptoms must also be placed the anæsthesia or diminished cutaneous sensibility already described, as well as the excessive motor weakness. It is probable that the absence or diminution of sweating also belongs to this category. It will be remembered that this symptom was undoubtedly present in Cases I. and II., and doubtfully in Case III. We are here reminded forcibly of myxœdema, in which diminution or absence of perspiration is so prominent a symptom, and, at the same time, these cases are still further removed from ordinary obesity, in which excessive sweating is the rule. Headache was also noted in all the cases.

Among other symptoms present in these cases should be noted hæmatemesis in Case I., hæmatemesis and epistaxis in Case III., and a recurrence of uterine flow many years after the cessation of menstruation in Case III. In Cases I. and II. the menopause occurred at thirty-five, and in the latter the flow was said to have been unusually free. In Case III. the menopause occurred at forty-six, and menstruation was likewise said to have been excessive. Finally, Case III. also presented a well-marked purpura. What the significance of these symptoms may be it is impossible to say. It may, however, not be out of place to recall

the not infrequent occurrence of uterine hemorrhages in women who subsequently suffer from myxœdema.

Bronchitis is a most frequent and persistent symptom in Case I., while both Case I. and Case II. suffered markedly from cardiac dyspnœa. Both of these symptoms were absent in Case III. By their presence we are again reminded of myxœdema, in which they are frequently present.

As already stated, fragments of the enlarged tissue were removed from Case I. by the Duchenne trocar, as also from Case II. In both instances fat-cells and connective tissue were found in various proportions, though at times the latter was decidedly embryonal in type; this was especially so in Case I., in which in certain areas embryonal connective tissue predominated. It would seem that this is the case in the more recent formations, while in the older areas a fully formed adult fatty tissue appeared to be present. It is especially to be regretted that the loss of the specimens from the autopsies of Cases II. and III. prevented a confirmation of these results. The autopsies, however, are not without interest when it is called to mind that in both cases the thyroid gland was found indurated and much infiltrated by calcareous deposit. It is impossible, however, to correctly interpret this condition in the absence of microscopic studies.¹

Now, with the above data before us, what view are we to hold in regard to these cases? Evidently the disease is not simple obesity. If so, how are we to dispose of the nervous elements present? Equally plain is it that we have not myxœdema to deal with. All of these cases lack the peculiar physiognomy, the spade-like hands, the infiltrated skin, the peculiar slowing of speech, and the host of other symptoms found in true myxœdema. It would seem, then, that we have here to deal with a connective-tissue dystrophy, a fatty metamorphosis of various stages of completeness, occurring in separate regions, or at best unevenly distributed and associated with symptoms suggestive of an irregular and fugitive irritation of nerve-trunks—possibly a neuritis. That this, however, does not embrace the whole truth is evidenced by such symptoms as the diminished sweating, the headache, and the contraction of the visual fields noted in Case I. However, the above inference is all that we are justified in making.

Inasmuch as fatty swelling and pain are the two most prominent features of the disease, I propose for it the name *Adiposis Dolorosa*.

¹ In the light of these interesting findings, it seems desirable that in all cases of obesity, whether typical or otherwise, the thyroid gland be studied.

THE PRIME ETIOLOGICAL FACTOR OF GLAUCOMA IS
CONSTITUTIONAL.¹By S. O. RICHEY, M.D.,
OF WASHINGTON, D. C.

THIS paper will be occupied with the presentation of one idea, for a *résumé* of the literature of glaucoma would unprofitably occupy much space, as so much has been written offering diverse views of its different features, each with a show of reason.

Mr. Jonathan Hutchinson, in the Bowman Lecture, 1884, discusses the relation between certain diseases of the eye and gout. The tissues of an individual long subject to the causes of gout may become modified in such a way that they are liable to suffer in a peculiar manner when exposed to the ordinary causes of disease; the *nervous* and *vascular* systems are specially so disposed. Rheumatic gout may have such a relation to true gout, and he names "hot eyes," calcareous bands of the cornea, arthritic iritis, relapsing cyclitis, *glaucoma*, and retinitis hæmorrhagica as having such connection; and asks if it can attack any of the *structures of which the nervous system is composed*.

In the London *Lancet*, January, 1873, he describes an iritis occurring at an early age, differing from other forms of arthritic iritis, in being persistent and insidious, rather than paroxysmal. Without any attack of acute inflammation, adhesions quietly form between the iris and the capsule of the lens. . . . This affection usually begins in but one eye, and advances to almost entire loss of vision in it, before attacking the other. It is insidious, and for the most part painless, but is liable to exacerbations and periods of improvement. It is remarkably intractable, prone to attack both eyes, and to end in blindness.

Such is the position of an acute observer as to the influence of gout upon the eye.

The question as to the *cause* of increased tension is still open, whether due to *too rapid infiltration*, or to *impeded excretion*, with a leaning to the latter.

Opposed to Mr. Priestley Smith's theory, that "glaucoma of every form is essentially a disease of retarded excretion,"² are the conclusions of Schnabel,³ supported by clinical and pathological studies, that "glaucoma may be present without obliteration of the sinus of the anterior chamber; that the latter can exist without glaucoma; that glaucoma

¹ Read at the meeting of the American Ophthalmological Society, July 20, 1892.

² Trans. Seventh International Medical Congress, vol. iii. p. 84.

³ Archiv Ophthalmol., vol. vii. p. 14.

can be cured without obliteration of the sinus of the chamber being removed."

"It has been proved by Mr. Windsor,¹ of Manchester, that acute glaucoma may occur where there is congenital absence of the iris."

A doubt, which reaches almost a denial, is general as to whether excavation of the disc is due to pressure, or not. In Rydell's² case, blind from acute glaucoma of three weeks' standing, *without excavation*, pain was relieved and tension reduced, but vision was not improved. Mauthner³ claims that "We find in the beginning of an excavation that pressure frequently is not increased. I have recently examined the left eye of a patient, in which there is the beginning of a pressure excavation, of which there was not the slightest sign a year ago, when I saw him for paresis of one of the muscles. The functional disturbance is extraordinary, and shows itself in transitory obscurations; central S. is less than in R. E., which has $S = 6/\text{VI}$, while with L. E. a few letters of 6 are not seen at 6 m. distance. Without glasses the patient, who is forty-five years old, reads with R. E., J. 2, with the left eye J. 3: F. undisturbed. The well-known appearance of the vessels is very marked at the upper lateral edges of the papilla. T. is precisely the same in both eyes, and falls even below the physiological maximum. Would such a pressure produce such a picture?"

"Some morbid process has attacked the intra-ocular end of the optic nerve, causing a diminished resistance (softening) of the lamina cribrosa, so that it yields to even normal pressure in the eye, but at the same time there is going on in the optic nerve an alteration, which has the greatest resemblance to that in the lamina cribrosa, and leads to a softening, to a giving way of the supporting connective tissue."⁴

Reading these comments on glaucoma with a free mind, our previous ideas are subverted, because we must conclude that increased tension is not necessary to excavation; that excavation is not always present, even when increased tension has existed sufficiently long to produce it; that excavation may result from⁵ "some morbid process" in the nerve, lessening its resistance; that increased tension is not dependent upon obstruction of the channels of excretion.

¹ A Practical Treatise on Diseases of the Eye, by Haynes Walton, London edition, p. 1170. See Ophthalmic Review.

² Von Graefe's Archiv, 1872, vol. xviii. pp. 1-51.

³ Archiv Ophthalmol., vol. viii. p. 38.

⁴ Vide supra, p. 39.

⁵ Garrod, on "Rheumatoid Arthritis," Reynolds' System of Medicine, p. 553: "In the early stage, when swelling is prominent, a considerable increase of synovial fluid is found, and the joint exhibits the same appearance as in case of ordinary inflammation. The lining membrane is often red from over-injection of the bloodvessels. If the bone be sawn through, it is often found spongy, and contains a large amount of *oily matter*, from the occurrence of a *species of fatty degeneration*." N.B. All italics are my own.

If the last proposition be true, that increased tension is *not* dependent upon obstruction of the channels of excretion—and Schnabel supports his conclusion by dissections of the organ which he had observed while affected with the malady—then increased tension *must* be caused by too rapid infiltration, or secretion. Schnabel argues further,¹ that glaucoma is a disease of the bloodvessels of the eye, which develops either gradually, or at once, in the region supplied by the long anterior and posterior ciliary arteries, the central bloodvessels, and those of the sclerotic circle; that the disturbances of nutrition and function are the direct result of these disturbances of circulation, etc.

Mr. Priestley Smith's theory was obviously derived from the study of glaucoma of local origin; and yet, as Mr. Brailey, of London,² says, "it fails to account for temporary glaucoma, for glaucoma without the characteristic application of the iris, for glaucoma in young persons, for one-sided glaucoma, for glaucoma in aphakic eyes, and especially for cases where a traumatic dislocation of the lens backward has been quickly followed by increased tension. It does not, also, explain the *invariable inflammation and atrophy* of the ciliary body and optic nerve."

To the theory of increased secretion, or more properly too rapid infiltration, a *vis a tergo*, some derangement of the general system, is a *sine qua non*. The uric acid diathesis, of which gout is a characteristic feature in many instances, offers the most satisfactory explanation: true gout, of acute inflammatory glaucoma; rheumatic gout, of chronic simple glaucoma.

In nearly all particulars acute gout of the toe and acute inflammatory glaucoma are alike. Observe the points of resemblance:

ACUTE INFLAMMATORY GLAUCOMA.

1. An inherited tendency.
2. Most frequent after the period of presbyopia.
3. First attack is usually in cold weather.
4. Premonitory symptoms: Impaired A.; premature presbyopia, increased H.; halo, rising clouds or smoke, heaviness of brow, shooting pains in the eye, increased tension. These may be so slight as to cause no anxiety.
5. Sudden seizure, usually at night.

ACUTE GOUT OF THE GREAT TOE.

1. An inherited tendency.
2. Most frequent after the beginning of senile changes.
3. First attack, usually in winter, or spring.
4. Premonitory symptoms may be so slight as to pass unnoticed, or may be very distressing.
5. Attack is sudden, usually between two and five o'clock in the morning. (Garrod.)

¹ Archiv f. Augenheilkunde, vol. xv. p. 311.

² Trans. Seventh International Medical Congress, vol. iii.

ACUTE INFLAMMATORY GLAUCOMA.

6. Constitutional disturbances; febrile excitement, with some nausea and vomiting.

7. Circumorbital pain, peri-corneal and sub-conjunctival injection, slight protrusion of globe, sluggish, dilated iris; cornea dull and anæsthetic, humors greenish, ischæmia.

8. As the attack passes off there is great chemosis, lachrymation, and photophobia. The cornea becomes roughened.

9. The inflammatory attack passes off in a few days or weeks.

10. The disease is not arrested: there may be a recurrence of acute inflammatory attacks, chronic inflammatory exacerbations, or the disease may progress insidiously.

11. No pus.

12. Urine. ?

13. No analysis of aqueous humor, so far as I know.

14. The disease may attack first one eye and then the other.

15. Occurs most frequently in women.

ACUTE GOUT OF THE GREAT TOE.

6. Chilliness, heat of skin and perspiration, thirst, loss of appetite, a white tongue, constipation, and restlessness.

7. Toe is swollen, red, hot, and exquisitely tender. Veins proceeding from the toe are turgid with blood, and the joint is stiff. Great tension of the skin.

8. As the attack passes off there is pitting of the skin (œdema), then desquamation.

9. Duration, from four days to three weeks.

10. Gout recurs, and the frequency of the paroxysms increases.

11. No pus.

12. Urine scanty, high-colored, and deposits a colored sediment on cooling.

13. Synovia contains urate of soda.

14. Gout not uncommonly seizes first one great toe, then the other.

15. Is rare in women.

Thus, each may be inherited and have the premonitory symptoms; the attack is sudden and at night; in each it is characterized by great pain, engorgement, and tension, followed by œdema and exfoliation; duration, from a few days to a few weeks; recurrence of the affection, possibly to attack the other side, or to become chronic. No pus.

Such is the clinical picture.

That acute inflammatory glaucoma is more frequent in females, and gout of the great toe more frequent in males, may be due to the greater emotional tendencies of women; for, according to Schweigger "mental emotion and loss of sleep favor acute glaucoma."

While women derive a certain immunity from podagra by reason of menstruation (Hippocrates), yet at the approach of the climacteric, a period of greater or less tendency to vascular cerebral disturbance, arising from the intermittence of the derivative action of this function, acute inflammatory glaucoma is most frequent, and chronic simple glaucoma develops.

"The great toe¹ contains a considerable amount of tissues peculiarly liable to become the seat of the deposition of urate of soda; as, for example, the cartilages and ligaments, tissues having either little vascularity, or nourished independently of bloodvessels; the great toe being

¹ Garrod, "Pathology of Gout," Reynolds' System of Medicine, vol. i p. 535.

very remote from the heart, the circulation is weaker there. . . . The reasons for the great toe on one side of the body being affected apply equally to the other; and hence, the disease not uncommonly attacks first one toe and then the other, within the short space of a few hours or days."

Anatomically, the eye is an extremity of the body, not quite so far from the heart as the toe, and is exposed to variations of temperature and to injury; the sclerotic, the cornea, and the tendons of the extrinsic muscles are of dense fibrous tissue, with little vascularity; the stroma of the choroid and iris is of reticular connective tissue, supporting pigment cells, bloodvessels, etc., the zonule of Zinn is a *fibrous* perforated membrane, the lens capsule is a structureless membrane, the corpus vitrei depends upon bloodvessels not its own for nutrition, and contains mucin, and (Picard) 0.55 per cent. of urea, and about 0.75 per cent. of sodic chloride. The posterior surface of the iris and ciliary body secrete the aqueous humor (synovia?) which contains a small amount of albumin, sugar, and sodic chloride, equal to $\frac{1}{50}$ of its volume.

With increase of blood-pressure and intra-ocular pressure, there is increase of albumin and the production of fibrin in the anterior chamber. (Jessner and Grünhagen.)

Taken with the fact that a local derangement, as a dislocated lens, does not seem sufficient to cause the *whole* train of symptoms, general as well as local, called glaucoma (though it may precipitate an attack which would probably have taken place at a later date), the clinical history of a seizure and the anatomical peculiarities of the regions under consideration present a picture of such mimicry as we find nowhere else repeated. The crucial test, the presence of urate of soda, I have had no opportunity to apply since recognizing the resemblance.

To again read Garrod,¹ "The impure state of the blood, due to the presence of urate of soda, is probably the cause of the disturbance which often precedes the gouty paroxysm; that is, of the so-called premonitory symptoms. Urate of soda in abnormal quantity in the blood is essential to an attack of gout, . . . but does not constitute gout; . . . that the amount of deposited urate of soda is not in proportion to the intensity of the inflammation, and that in some the infiltration may ensue and give rise to scarcely any inflammatory action. . . . The inflammation of the gouty paroxysm tends to the destruction of the urate of soda in the blood of the inflamed part, and probably of the salt also which is thrown out." Soelberg Wells² observes that "males who are attacked by glaucoma frequently suffer from gout, or disorders of the digestive organs:" of primary glaucoma, "when

¹ Reynolds' System of Medicine, vol. i. p. 533.

² A Treatise on Diseases of the Eye, 3d Amer. ed., 1880, p. 569.

once the one eye has become affected by glaucoma there is great tendency in the disease to invade the other also."

Mr. Hutchinson¹ asserts that "all forms of rheumatism, and all forms of gout, are included in the common term, arthritic. But we cannot limit the term to the joints, as its etymology might seem to require, but must allow it also to apply to certain affections of the muscles, fasciæ, tendons, and other fibrous structures which have been proved to be dependent upon the same peculiar state of health. . . . Under the term rheumatism we include all arthritic maladies which are not proved to be gouty. . . . I must protest, at once, against any attempt to limit the term gout to cases in which attacks of acute inflammation of the great toe occur. . . . Rheumatism differs from gout in being of *nerve* origin, and due to reflex disturbance of nutrition; . . . it is, according to my hypothesis, the basic diathesis to which a small minority of cases of gout is superadded."

The younger Garrod says that rheumatic gout lacks the distinguishing feature of gout, urate of soda.

Many of the manifestations of rheumatic gout are associated with chronic glaucoma, viz.: enlarged or distorted joints, a peculiar senile pallor, or muddiness of the skin; periods of mental depression, and other symptoms, attributable only to changes in the nervous system. I have found nowhere any reference to pathological alteration of nerve tissue in gout, although the existence, character, and specific cause of such changes, which are *presumed* to exist because of the nervous symptoms present in lithiasis, would have important bearing upon the subject in hand, in explaining the structural changes in the lamina cribrosa and the intra-ocular end of the optic nerve, the condition of diminished resistance associated with excavation without increase of tension, in cases of chronic glaucoma.

Dr. W. W. Johnston,² Washington, D. C., published some thoughts "On the Nature and Treatment of Forms of Disease characterized by Indigestion, the Presence of Bile, Urates, and Uric Acid in the Urine, and by Nervous Symptoms," which suggest a possible cause and explanation of the nerve changes in chronic glaucoma. In his own words, "The question of the continuous production of toxic substances in the intestinal canal in health, and the protection of the organism by physiological elimination, as well as the auto-intoxication of the organism by the absorption of poisons in alterations of the gastro-intestinal tract, was developed in detail by Professors Albertoni and Silvia at the meeting of the Fourth Italian Congress of Internal Medicine, held in Rome. Professor Silvia enumerates the following substances as probable

¹ Trans. Seventh International Medical Congress, vol. ii. p. 92.

² The Medical News, March 12, 1892.

poisons: peptoxine, organic bases (ptomaines and leucomaines), indol, phenol, lactic acid, ammonia, sulphuretted hydrogen, acetone, etc. The direct proof of the fact that the nervous phenomena in such cases are due to the absorption of toxic matters from the intestines is not yet found, but the argument is a forcible one. The existence of indigestion is known by the symptoms: the presence of toxic matters in the intestine in health is proved. . . . The relationship of acute indigestion and nervous disturbances, and the association of fermentative dyspepsia with nervous symptoms, and an excess of these products in the urine and feces, give sufficient grounds for adopting this theory as reasonable."

Dr. Johnston has given much attention to the subject of digestion, and if a reference to his able paper will induce those who have the care of cases of chronic glaucoma to read it, it will probably divert attention from glaucoma, except as a local manifestation of a general malady (although he does not refer to glaucoma), broaden the view of the subject, and enable us to comprehend the changes in nerve tissue going on elsewhere in the system in rheumatic gout, by that which takes place in the intra-ocular end of the optic nerve, exposed to observation, in chronic glaucoma.

Returning to the subject of intra-ocular tension, Mr. Priestley Smith¹ claims that "high tension depends more upon an excess of blood in the eye than upon an excess of intra-ocular fluid," while Dr. Spender² has observed, as early symptoms of arthritis, increase of pulse rate with high arterial tension.

Mr. Hutchinson³ concludes that "it is probable that there are many different forms of inflammation of the eye, or of parts of it, which are in connection with gout. They may be divided into two groups: *a*, those which go with acquired, humoral, or renal gout; *b*, those which depend upon inheritance of structures damaged, or, at any rate specialized, by gout in predecessors. The difference between the two classes of affections is very marked. In the one, attacks of a transitory nature are the rule, and the attacks are often acute and attended by much pain. In the second group, although a tendency to temporary recovery and recurrence is often observed, yet, there is a great proneness to chronicity, and persistence. The invasion is often insidious, but the disease is usually in the end destructive."

If the difference between the forms of acute inflammatory and chronic simple glaucoma had been in the mind of Mr. Hutchinson the description could not have been more effective than in the specification of the two groups named above.

¹ Ophth. Rev., vol. vi. p. 196.

² Garrod: A Treatise on Rheumatism. Am. ed., 1890, p. 245.

³ Ophth. Rev., vol. iii. p. 385.

His address will bear reading with this thought.

Ordinarily, when both eyes are attacked by the same disease process, we rationally conclude that the cause is constitutional, and do not treat an expression of the dyscrasia, but rather its cause.

In chronic glaucoma, a local manifestation is treated (for, sooner or later, both eyes are attacked), and then we wait to see what "turns up," with about the results presented by Dr. Bull,¹ of New York, to the American Ophthalmological Society, in 1889; the detailed history of ninety cases of chronic simple glaucoma, subjected to the operation of iridectomy, during a period of seventeen years. The paper is most interesting and instructive, especially the summing up: "One hundred and fifty-four operations were done on the one hundred and eighty eyes under consideration. Vision was temporarily improved by iridectomy in both eyes in two cases, and in one eye in six cases; but in all eight cases, after a few months, a steady loss of vision and narrowing of the field set in, and continued progressively as long as the patients were under observation.

"Vision remained unchanged, neither better nor worse, after the operation, for a period of one year or longer, in both eyes in eight cases, and in one eye in twenty cases.

"Vision grew slowly and steadily worse after the operation, in both eyes in forty cases, and in one eye in twenty-nine cases.

"Vision grew rapidly worse after the operation, in both eyes in two cases, and in one eye in eight cases."

He concludes that "the health and age of the patient exert a decided influence upon the operation, and any marked evidence of senility is distinctly unfavorable to the operation."

Dr. Gruening,² of New York: "In chronic glaucoma with degenerative changes, neither iridectomy nor anterior sclerotomy will give the patient the desired relief; posterior sclerotomy *may do it at times*."

Mr. Power,³ of London: "In cases of chronic glaucoma no operation is of much service." This terse statement, it seems to me, covers the whole ground.

The good results of operation in chronic glaucoma are in comparatively small ratio, and are therefore accidental, and not scientific; for it often precipitates disaster by additional irritation. So long as the two chief clinical characteristics of glaucoma, increase of tension and excavation of the disc, are not satisfactorily explained, the management of such cases must be empirical. The author of iridectomy for glaucoma acknowledged it to be empirical, and only experience has taught us in

¹ Trans. Amer. Ophth. Soc., vol. vi., part 2, pp. 246, 291.

² Ibid., 1889.

³ Trans. Seventh Internat. Med. Congress, vol. iii. p. 106.

what cases it is of most value, those of acute inflammatory glaucoma; for here it saves the eye until another time; it does not cure the disease. Dr. Bull's statistics do not teach us to do iridectomy in chronic glaucoma, cases of which form of the disease are in excess of any other, unless upon the plea of *dernier ressort*—because we know of nothing better. They indicate that the majority of eyes are worse after an operation; in a few the *status quo ante* is maintained; in a still smaller percentage there is some improvement. With this diversity of result, who, save in the occasional case of *immediate* gain, or loss, to the eye, can say what influence is attributable to operation? Might the case not have done just as well without interference? Is the surgeon justified in a feeling of certainty that he has done a service? If all such cases followed *approximately* a given course he would have a guide; but they vary so much. If it progresses slowly after an operation, it might have done so without it. If it remains stationary for a time, can that be attributed to operation? If the patient goes rapidly blind, has he a right to reproach the surgeon? In operation is *possibility*, not *probability*. In simple glaucoma it has a questionable rationale, and experience teaches that, if done at all, it must be done with caution. It is double-edged, and may cut either way.

It is a prime necessity that a quiet, healthy, out-door life should be led, apart from occupations of much nervous excitement, causing loss of reserve force; that a condition of self-possession should be maintained; that the dietary should be regulated as to time, quantity, and quality; for over-feeding and bad feeding is a conspicuous vice of the age. In adult life the effort should be to preserve the balance between waste and repair, and to see that both processes are normal. This is a duty which the family physician may share.

As such cases pursue so chronic a course, it would seem wise to discover the constitutional cause, and to begin with that, instead of with the last expression of the disease, leaving the cause in action.

Rational management of the disease involves a study of the general condition and a correction of all the habits of the individual. This is difficult, but our function is advisory, and each sufferer must "work out his own salvation" with our guidance.

By controlling the quantity of food productive of uric acid, and by reducing the whole quantity to the possibility of easy digestion and assimilation, thus lessening the amount of toxic substances in the intestinal tract; by the regular entire excretion of what is excessive by way of the kidneys and bowels, harm in this way is obviated. Tonic aperients (not irritants and excitants), which encourage natural action of the intestines, serve a good purpose when used with judgment. Hunyadi water, taken at bedtime, lies in the tract all night, does not purge, but by its solvent power prevents accretions. Nothing should be

done to lessen the digestive power, and a quantity of food should be taken, small enough to *insure* its digestion and proper disposal. Anything (as coffee) which retards digestion must be rejected for obvious reasons.

Salicylate of phenol, it is claimed, has been found in the joints of gouty persons taking it; therefore its purpose is apparent.

Lithia waters secure the excretion of some uric acid; piperazine, a new synthetical compound, is commended as having twelve times the solvent power of lithia upon uric acid. Strychnine acts by stimulating the functional activity of all the organs of the physical economy.

Galvanism, if properly and steadily used, is profitable. After ten minutes' use of two milliampères direct current to the sympathetic, in an ordinary case, ocular tension is lessened, the pupils seem more active, and the patient becomes calm, often almost falls to sleep. By the experiments of Onimus and Legros¹ it has been shown that if the direct current (positive pole at the nerve centre) be employed, the circulation is augmented; within a few moments the arteries have increased in bulk, and the whole network of capillaries is seen in great commotion. Faradization contracted the bloodvessels, but after a time contraction ceased, and the arteries became larger than before the application. The continuous current, on the other hand, renders circulation more active, and reestablishes it when it has been arrested. The induced current causes spasmodic contraction of the unstriped muscle, while the continuous current produces a *vermicular* contraction (Bartholow). The latter thus favors the natural movement of the vessel, and while *directly* increasing the amount of blood passing, by reaction the amount of blood in the part supplied by the vessel is reduced to the normal. The object to be gained, stimulation of the cervical ganglia, the trophic centres of the region of the trigeminus, is accomplished as well with the cathode held in the hand as in contact with the affected region; yet, when placed on the temple, or above the eye, it has some additional *mental* effect, which is not undesirable.

The writer has endeavored to cover the ground as concisely as possible: to offer the salient points of a view of the subject he has entertained for several years, especially in regard to *too much food*. He thinks that in the hypothesis discussed we find the true etiological factor of the most intractable of diseases, chronic glaucoma; that acute inflammatory glaucoma is a paroxysmal expression of the same affection; that local irritation, or trauma, excites an attack of glaucoma only in the presence of the dyscrasia; that operation saves the eye during a paroxysm; that operation serves little purpose in chronic glaucoma, even when it does not, by irritation, hasten the disease process or precipitate a paroxysm;

¹ Traité d'Electricité Médicale, Paris, 1872.

that chronic glaucoma is a neurosis—a progressive atrophy with the feature of inflammation with deficient power, varied by periods of *seeming* rest; that correcting and controlling individual habits, especially in the *amount* and character of food taken, will do more to preserve vision than operation; and that there may be a possibility of aborting chronic glaucoma, if the tendency to it be recognized at an early stage.

HYSTERICAL MANIA.

By ELY VAN DE WARKER, M.D.,
OF SYRACUSE, N. Y.

GIVING the broadest possible range to the definition of insanity, there are yet certain mental states fully as incapacitating and equally difficult to treat that, by common consent, are not included under this term. Without attempting to define what hysteria really is, I am safe in asserting that the phenomena are manifested within the intellectual field. Even if it is manifested as a bodily condition, with no apparent trace of a mental associated error, yet these bodily conditions are largely subjective ones, and have their real status in a perversion of a conscious state—a condition as evidently objective as a phantom tumor that can be made to depend upon a mental impression. In this relation I use the term mania, not in the sense that the diseased mind has originated a delusion, but because the mind has lost the power of diverting itself from certain fixed ideas, and about which it circles in an endless iteration. So far as an alienist is able to define, the disease which it is his so-called specialty to treat does not exist without a delusion. But we as gynecologists must recognize the fact that the mental function may be entirely unhinged without the trace of a delusion. The mind is as much in a pathological state, so far as normal logical and associated ideas are concerned, as though dementia or active mania existed.

Mental hysteria expresses itself along certain well-marked lines that sharply define it from insanity. This form of hysteria may be classified in groups just as insanity is classified, and like the latter has a comparatively narrow range. Take as an illustration the melancholic form. Every waking moment is devoted to tears, or is absorbed in the deepest gloom. But no man who is familiar with the work of the gynecologist would say that it was melancholia in the sense of the alienist, and what is still more remarkable, it never will be, so far as there exists any tendency in the disease itself to degenerate into insanity. Many of these cases drift into asylums, to their great misfortune, and I am sorry to be obliged to add the deplorable fact that the actual mental status of

the patient is never recognized by the professed insanity doctor. This is the type of case that belongs to the gynecologist, and has for a quarter of a century afforded ground for the demand that a competent expert be assigned to each hospital. We have never been able to bring this simple fact before asylum managers in a practical form. They have so completely misunderstood the position we have taken that they have consented to the appointment of female physicians without in any way exacting a practical knowledge of gynecology. Basing my conclusion upon my own personal experience, I believe that ten per cent. of female inmates of asylums—under thirty-five years of age—can be restored to society by proper treatment and removal from the society of the insane. I regard removal from the environment of the asylum as essential to recovery, on account of the marked initiative tendency in the mental action of the hysteric. Mental operations in this class partake largely of automatic action, and the force of example is sufficient to constitute a morbid impulse.

Many of these cases unhappily drift into asylums, and are rarely ever discharged. It is one of the attending evils of massing large numbers of the insane together, that proper classification and discrimination cannot be made. It would require an insanity doctor to understand physical diseases, as very few of them at this age of the world do, to realize that many of the inmates of his asylum are not insane at all, but are simply imitating what they see around them. This brings to mind a matter that many years ago I contended for, supported by the powerful alliance of the late Dr. Wilbur, a distinguished alienist, that asylum physicians ought to be appointed from the ranks of the general practitioners of not less than five years' service. The majority of asylum physicians, aside from the fact that they have passed through a medical college and have received a diploma, are not medical men at all. It is ample proof of this, that the usual practice is to call in the local general practitioner to treat common diseases among the inmates of even large institutions.

The most common type of mental hysteria is the melancholic form. Its diagnostic features are that the cause and its mental reflex are equally apparent, and exist on parallel lines. You observe in the objective conditions sufficient reasons for the mental wreck. Every mental operation is attended with logical coherency; there are no delusions or morbid suspicions. Why, then, should we say that she approaches the insane type? Simply because her will is absolutely powerless to divert her mind from a fixed and dominating line of thought. Its direction is always turned inward upon herself. Her wasted life, her neglected duties, and the poverty of hope that she will ever get well. There is an iteration about it that Shakespeare has well called damnable. In hospital work I have known the strongest nurses completely

broken down from constant association with such a case. She is not a monomaniac, for that implies a fixed delusion coexisting with a more or less normal remnant of mental action. The train of thought that produces this state of morbid mental fixation is based upon actual facts, the importance of which she may not in any way exaggerate. She simply comes to a fixed and morbid conclusion that renders her mind as useless for the purposes of life as though she was beset by the wildest delusions.

Another phase is the hysterical type of the dement. I measure it by this well-known form of insanity because outwardly there is not a trace of a thought or emotion. She will not answer a question or express a wish. She is not resistant; everything about the outbreak is passive. She is receptive and tractable, but cannot originate an idea. Several days will pass in this condition, when the will power suddenly regains its force, and normal mental action be recovered. This form frequently marks the menstrual crisis, or follows a prolonged outbreak of the melancholic form, oftentimes attended with unappeasable tears. A more rare form of the hysterical dementia follows surgical operations, in which food is refused, and the patient positively but stubbornly refuses the personal attentions of her nurse. This form is not without danger, as I have recently experienced in a very delicate emaciated blonde approaching middle life, and on whom there was recently performed a simple operation for fistula-in-ano. In the hospital she could be fed by the care and skill of her nurse, but when removed to her own home died from exhaustion after a week or so. Her removal was the result of the very common notion that such patients will quickly recover if they can only be removed to their own home. While this form of hysterical dementia always embarrasses the conduct of a surgical case, it rarely has the unfortunate result just noted. Indeed, what forms a strong diagnostic line between the hysterical form and insanity as a mental disease is the self-limited character of the former. Knowing his patient, the surgeon can rest assured that a comparatively brief time will see his patient restored to a normal mind, while in the latter it is among the most hopeless of mental diseases.

The last form of hysterical alienation is that form known as mania traumatica. To classify this comparatively common condition among the chronic mental diseases is entirely to misunderstand its nature. It was well understood about forty years ago, with a fairly abundant literature, which was entirely lost sight of, so that a few years ago it found its place in current literature as a new discovery of a surgical complication, until the profession was better informed by a review of its history from the pen of Dr. Mary Putnam Jacobi. It is an interesting fact that surgical mania began to attract attention about the beginning of the era of anæsthesia in surgery. A case of my own proved in a most

pointed way this connection. A middle-aged German was admitted to the Central New York Hospital for a genito-plastic operation. She passed out of the ether stage only to pass into most violent mania, with morbid suspicions and active motor disturbances. In about a week the mental disturbance had passed, and she made a quick recovery. I afterward learned that a similar attack had followed anæsthesia for a dental operation. My repair operation was a failure and had to be repeated—this time without an anæsthetic and without any mental disturbance. The literature of the subject shows that occasionally a man develops surgical mania, but the vast majority are women. Mania of this character, of a few hours' duration, is very frequently met with after an anæsthetic, and always gives the surgeon a few bad hours, especially after a severe operation.

The brief recital of a few cases to more fully illustrate the different forms of the mental type of hysteria will not be out of place:

Mrs. S., aged thirty-five years, sterile, retroversion, utero-pelvic adhesions, defective nutrition, obstinate cervical catarrh, constipation, occasional dysuria; a delicate blonde, and a sufferer for years from sacralgia and pelvic pain. She would have attacks of spasmodic action of the abdominal muscles, simulating tremors; always excited by manipulation. Her sole subject of conversation was her peculiar symptoms. She slept fairly well, and without cause would suddenly refuse to speak or answer questions. She would do as she was told, but always passively. Would not dress or undress herself, but offered no resistance to the attention of her nurse. These attacks would last three or four days, when she would talk freely. During these attacks there were no delusions. When asked why she refused to speak, she replied that she was tired of talking, as it did no good, and she would never get well.

Mrs. B., aged fifty-four years; four adult children; a German by birth; sub-involution and great hypertrophy of vaginal portion; double laceration; masses of scar tissue; large retention cysts, giving the cervix a nodular appearance; climacteric at fifty years. Was admitted to the hospital as a case of cancer of the cervix. Operation under ether. The second day became very restless, and during the night got out of bed several times and insisted upon going home. Before the third day she became violent in response to the gentle force necessary to keep her in bed. Her one delusion was that she was deserted by her husband, and she must leave in search of him. Bringing her husband and children into the room in no way changed her delusion or caused her to desist from her violent efforts to leave the hospital. The active mania subsided into a melancholic form, which cleared away in about ten days, and the mind became normal. The repair operation was a failure, and was repeated in a few months without an anæsthetic and without mental disturbance, and with good results. A feature of the mental outbreak greatly resembled the efforts to resist that a patient will make in initial anæsthesia with the form of delusions that follows the narcosis.

Mrs. V., aged thirty-eight years; three children—eldest twelve years, youngest four years. Uterus retroverted, enlarged; double laceration of neck; perineum torn to the sphincter. Admitted to the hospital for a

repair operation. She attended to her domestic duties until about a year previous to admission, when she became unfitted for social life by her profound melancholy. She was free from delusions; her naturally affectionate and demonstrative nature remained unchanged. Nearly every waking hour was passed in tears. She could not meet a mere acquaintance without bursting into tears. A caress from one of her children or a pleasant word from her husband was always a signal for an outbreak. Naturally of a studious habit, she lost all interest in reading, and would talk or think of nothing but her illness and its hopeless nature. She was regarded as a melancholic and narrowly escaped an asylum. After her operation the restoration to a normal mental tone was so gradual and slow that we were fearful that she never would be restored. In about a year, however, the mind was acting in nearly a natural manner, and she began to take her old place in society and the home.

The practical question is, What shall we do with these cases? If we class them among the insane they cannot be admitted legally into any institution, public or private, other than an asylum, unless a man is engaged who has had a certain number of years' experience in the so-called medical treatment of the insane. This is the law in the State of New York. No institution can admit them that is not provided with this lay figure. Only a few months past I tested the matter, and found that the law made it illegal to admit a patient known to have any mental defect. Many of these cases are the outcome of chronic salpingitis and ovaritis, and a laparotomy would safely and quickly cure them; but even for the purposes of operation you are not entitled to the legal custody of these patients. These cases are received into gynecological sanitariums and hospitals, but it is done in violation of the law. It is evident to all right-thinking people that a law ought not to be upon the statute-books the violation of which is compelled by the higher law of common humanity. When cases of this class take on the periodical form of mental disturbance they are, among the laboring classes and people of indigence, sent to asylums, and, as I have already stated, rarely restored to sanity. The law ought to be so modified that cases of this character that require the attention of gynecologists should first be given all needful attention. Insanity is already becoming such an important matter in our present social development that any method that would serve but ever so little to lessen the vast aggregate of the insane ought to receive prompt attention. Reform, as the past fully proves, will never come from the ranks of the asylum managers, but must originate in the indignant protests of the medical profession.

MORPHŒA WITH MACULÆ ATROPHICÆ.¹

By LOUIS A. DUHRING, M.D.,

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THE patient is an Englishwoman, fifty-five years of age, a brunette, spare, but in good general health. There is no apparent cause for the disease. It first manifested itself a year and a half ago, and has been gradually spreading. The regions invaded are the nape of the neck, and the adjoining scalp to a slight extent; the chest just below the left clavicle; the wrists and forearms. Several stages of the process exist, and the lesions are so different as to require separate description. Three distinct kinds are noted:

1st. Whitish patches of skin with manifest structural change in the true skin, of the nature of a peculiar fatty degeneration of this structure, constituting the commonest form of the disease. 2d. Distinctly circumscribed, depressed, and cicatriform whitish spots, varying in size from a small to a large pea, which plainly exhibit wasting and thinning of the true skin, the lesions resembling scars from syphilis, being thin, soft, and pliable. 3d. Patches of mottled, brownish-red, pigmented, structurally altered, atrophic skin, with a broken border or margin of firm, variously sized, irregularly shaped, papular elevations. Over these patches here and there are distinctly marked bluish-purple veins running in various directions. The skin in the central portion is thinned, and the border, as stated, is thickened, but nowhere is the skin bound down to the subcutaneous tissue, the whole patch being freely movable over the tendons and fasciæ. 4th. Enlarged, bluish-purple veins, identical with those on the patches of the wrists, which run up the forearm and are not associated with the other forms of disease described, although they are in the neighborhood of some atrophic macules. Having thus outlined the chief features which characterize the affection as a whole, the individual lesions and their distribution upon the several regions involved may be referred to more definitely.

On the back of the neck at the line of the hair, partly on the scalp and partly on the non-hairy portion of the neck, there exists an irregularly shaped, sharply defined, whitish patch of skin, the normal structure being changed into a whitish, lardaceous, non-indurated, soft, pliable, freely movable patch. The sense of touch with the fingers does not determine any increased thickness or structural change, so that in picking up the skin with closed eyes one would hardly detect disease. This patch is about two inches in diameter and is not surrounded by any border or hyperæmic zone or by injected veins. The hair of the scalp growing from the patch is of natural color, blackish, and not whitish as might be expected. This lesion represents one of the varieties of morphœa, and according to my experience the earliest and mildest phase of the disease.

Near by this patch, on the back of the neck, are several pea-sized, rounded, sharply defined, slightly depressed, shallow, whitish or pearl colored atrophic macules with thin skin which at first glance resemble scars from the large pustular syphiloderm or from burns resulting from

¹ Read before the College of Physicians, February 3, 1892.

the application of a hot iron. They are disseminated upon the neck on either side of the median line, and show no special distribution or arrangement. They are in no way different from the typical maculæ atrophicæ which are met with occasionally upon various regions, and usually without other forms of cutaneous disease.

Upon the flexor surfaces of the wrists are two symmetrical, rounded, atrophic patches, the size of a silver half-dollar, defined in outline, with a raised, indurated, irregular, uneven, papular border, and pigmented, of a mottled, brownish-red hue. The central portions of these patches are somewhat wasted and depressed, the skin being thinned, but soft and supple. Some enlarged and purplish veins run irregularly over the surface. On the flexor surface of one forearm, running up toward the elbow, there exist several pea-sized, whitish, atrophic macules, identical in character with those on the back of the neck. They incline somewhat to take on a linear arrangement rather than to be widely disseminated.

The lesions which have been described constitute the whole disease. The several varieties have no association with one another, but they are plainly due to the same cause. They are not stages of one process, but are distinct forms of cutaneous change, beginning and running their course as such. The patient complains of no pain or serious inconvenience from the disease, and seeks medical advice because of the disfigurement and of the tendency of the process to waste and atrophy.

The case represents an unusual phase of the somewhat rare disease morphœa. Many years ago I pointed out that this affection was characterized not only by the so-called "patch," but moreover in some cases by a variety of lesions, which might occur either singly or in combination. In the third edition of my *Treatise on Skin Diseases* (published some years ago) attention was directed to the observation that atrophic macules sometimes were present with the characteristic lardaceous patch. The occurrence of these two forms of lesion together, however, as in the case before us, I regard as rare, one or the other variety of atrophy alone usually existing.

Morphœa must be classified with the atrophies, and not with the hypertrophies, as it has been by some prominent authors. The process is distinctly atrophic in all its essential features, especially in its course and termination, which are characterized by degeneration of the skin and subcutaneous tissue with usually more or less thinning, shrinking, and wasting or degenerative atrophy. The present case illustrates the close relationship pathologically of maculæ et striæ atrophicæ with the common plaque of morphœa, as this latter was originally described by Addison and E. Wilson. At that date the affection seemed to have been scarcely known in Germany, and moreover even now it appears to be rarer there than in England or in this country. Many years ago, during a long sojourn in Vienna with daily attendance upon the clinics for skin diseases, I do not recall having observed a case.

Concerning the diagnosis, no difficulty can exist, it seems to me, if we are in the habit of studying cutaneous disease from the standpoint of anatomy and pathology, and more particularly the latter. This classification of skin diseases, upon the basis of general pathology, is not only the most scientific, but what is of more importance, is also the most practical and useful for our daily dealings with these diseases. The affection before us belongs manifestly to the atrophies, the process at work being essentially degenerative and atrophic in its phases. This point established in our minds, there remains merely to find a place for it in this class, and it plainly must be grouped with atrophies of the true skin. Such forms of atrophy are comparatively rare, the true skin not being prone to take on atrophy as a primary process. The several affections of this kind which may be classed together are atrophy of the skin proper (*atrophia cutis propria*); *maculæ et striæ atrophicæ*; *morphœa*; and some forms of *scleroderma*, the two latter affections sometimes coexisting.

The treatment of these cases is generally unsatisfactory, the prognosis, however, depending a good deal on the variety of the disease present and on the stage of the process. In some cases arsenic internally is useful, but in the patient before us local inunctions with stimulating ointments and oils, with massage, electricity, and frictions will probably prove more beneficial.

THREE CASES OF DERMATITIS HERPETIFORMIS ORIGINATING FROM CAUSES CONNECTED WITH THE UTERINE ORGANS.

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THE admirable work done by Dr. Duhring and supplemented by Brocq has so familiarized the symptomatology of dermatitis herpetiformis that the diagnosis of the cases of the disease presenting themselves has become a matter of comparative ease. The same degree of progress has not, however, been made in our knowledge of the etiology and pathology of the dermatosis, nor does there exist unanimity of opinion in regard to its nature; so that the careful recording of all cases furnishing details bearing upon these points is of the greatest importance, in order that, in time, a critical and comparative analysis, and perhaps the formulation of conclusions satisfactory to all, may be made in regard to the pathogeny and nature of the process. For this reason I would report the following cases, which present many features of interest and importance.

CASE I. (Demilt Dispensary.)—Female, aged thirty-five years, intelligent and bright; consulted me July 19, 1890, giving the following details in regard to herself and the cutaneous disease from which she was suffering. Her general health had always been good, but at the age of twenty-five she had had an attack of gastric dyspepsia, and off and on since then there had been occasional returns of the same trouble. Married at twenty-four, she has had three children—an interval of five years occurring between the first and second, and of four years between the second and third. The skin disease had begun in the third month of this last pregnancy, appearing first upon the feet, and then rapidly becoming universal, under the form of intensely pruritic "hives," as large as a fifty-cent piece, which appeared in successive crops. When about five months pregnant, her husband died and she experienced intense worry and anxiety, as she was thus obliged to provide for both herself and her children. The eruption immediately became aggravated, fresh crops of lesions of various types appearing, the pruritus and subjective discomfort becoming almost unbearable, and all the distressing circumstances surrounding her culminated in a miscarriage at the seventh month. Temporary amelioration of the cutaneous process ensued, but only for a short time, for in a few weeks a severe relapse occurred, and the course of the disease ever since has been one of alternate outbreaks and periods of comparative ease and quiescence. These latter, however, would always be shortened by mental or moral irritation of any kind, by anger, or by increased worry and anxiety—a fresh outbreak occurring or an aggravation of existing symptoms ensuing. After her miscarriage she became a wet-nurse, and pursued that occupation until about May 1, 1890. For several months previously she had been much worried and very despondent, because her earnings had not been sufficient to support her children, and in April, 1890, the severest attack of the disease began to appear. Prior to this outbreak, erythematous patches and groups of papules and vesicles alone had appeared, but in this relapse, and for the first time, bullæ also occurred more or less generally over the body. The disease had now existed nearly two years, but her functional health had been very good, except that there were occasional attacks of dyspepsia.

When the patient was seen by me, this last outbreak had subsided to a considerable extent. There were still, however, numerous lesions over the body, especially on the extremities, and the pruritus was still intense in character. On the surface, papules and small vesicles arranged in groups of variable extent were seen, while here and there were irregularly-shaped, tense and flaccid bullæ. Numerous crusts and scratch marks, and diffuse and small circumscribed pigmented areas, the site of former lesions, were also present.

While the patient was under observation, a marked feature observed both before and during an outbreak was excessive general hyperidrosis, but especially of the hands, feet, and axillæ. A number of relapses also occurred, and they varied in intensity and extent as well as in the type of the lesions—papules alone, or papules and vesicles, or both and bullæ. The pruritus and burning sensation was at times only slight, but then again would attain such a pitch as to bring on a severe hysterical attack, and after this an outbreak would regularly follow, consisting of groups of vesicles and papules or erythematous patches. While she was under my care, the patient's material circumstances did not

improve; her worries and anxieties persisted; she was despondent and melancholic, given to brooding, and she obtained benefit from no form of treatment used. Undoubtedly these mental and moral disturbances nullified all attempts at improving her condition, for, as they had previously done, they continued to call into existence new outbreaks of the process. The patient was seen by me continuously until in September, 1890, she ceased her visits. She was practically then in the same condition as at first, and the disease followed the same course as during the previous two years. Recently, however (March, 1892), the woman returned most unexpectedly to tell me how she was. She stated that from the time I had last seen her she had not followed any treatment, but in December, 1890, considerable amelioration of her material circumstances had come about; her two children were taken care of by her husband's relatives, and she was thereby relieved from her constant worrying and anxiety on their account. She also obtained a better situation and earned enough money to support herself well, to obtain proper food, and to enjoy life. As a result, there was a diminution in the intensity of the process, relapses became infrequent, and about April, 1891, entire cessation of all the objective and subjective manifestations of the disease occurred. Since that time she has remained absolutely well, and, in fact, when I saw her she was in perfect health; the cutaneous surface was without a trace of the former trouble beyond slightly pigmented areas here and there.

From the clinical history of this case it can be seen that the primary lesions were erythematous patches of various sizes—in fact, the patient pointed out similar ones at the time I first saw her—which remained in association, or were quickly replaced by papules and vesicles appearing in successive crops, all being accompanied from the beginning by the most intense pruritus and burning pain. When these features, the clinical course of the process, and the condition—pregnancy—under which it arose are taken into consideration, the dermatosis agrees so closely with the herpes gestationis of authors that there can be no question but that it primarily represented an example of that cutaneous affection, though in its subsequent history it differed in some particulars from other recorded instances of the same disease. It is thus the first and only case which from its very inception ran a chronic course, persisting with undiminished severity for an indefinite period of time after pregnancy had terminated, while all the other cases in literature underwent a temporary aggravation after delivery, to gradually disappear at the end of a few weeks, and a chronic course became instituted only after a series of successive attacks developing during successive pregnancies.

It does not, however, appear to me difficult to explain this deviation in type. The reason for it, I would find in the neuropathic condition of the patient, induced by the severe mental and moral emotions she experienced in the fifth month of pregnancy, by the death of her husband, by the worries and anxieties entailed upon her by the inadequate

support furnished her children by her own work, and by the miscarriage in the seventh month, a condition which was not terminated by the emptying of the uterus, but one which persisted not only unchanged, but even in an increasing degree for very many months after. It is to the existence of this neuropathic state and the constant repetition of the mental and moral emotions, the anxieties, etc., that I would, therefore, ascribe the persistence of the process and the unceasing occurrence of relapses after the termination of the pregnancy. In other words, the primary cause—the pregnant uterus—being removed by the miscarriage, the cutaneous process in all probability would, as in the other recorded cases, have disappeared, but the mental troubles then coming into play as secondary exciting causes, the disturbed conditions of which the skin affection was the expression were kept up, and the persistence and chronic course of the dermatosis was the result. The importance of these circumstances in connection with the process was not judged from the patient's assertion and observation alone, but I myself noted so repeatedly and regularly the occurrence of relapses and an aggravation of the cutaneous symptoms after any increased worry, anxiety, or mental emotion, that no other conclusion could be reached but that a most intimate connection existed between the dermatosis and disturbances of the nervous system, brought about through the channels of the mental and moral faculties. In consequence, it appears to me perfectly logical to conclude that if these factors operated at one time in the manner mentioned, they must have had the same influence at other times also, and, therefore, it would be perfectly justifiable to ascribe to their occurrence the persistence of the process after the termination of the original inducing cause.

The herpes gestationis of authors has been claimed by Dr. Duhring not to be an independent disease by itself, but to be merely a phase of his dermatitis herpetiformis—a claim, moreover, recognized and allowed by Brocq in his analysis of the whole subject; and, judging by this case, I would certainly accept the opinions of both of these dermatologists. I would do so for the reasons that, when the patient came under my care and while she remained under my observation, the case in its entire symptomatology and behavior was absolutely undistinguishable from any case of dermatitis herpetiformis the outcome of any other cause than pregnancy, and furthermore, its entire clinical history from the very first presented those marked features attached to that form of cutaneous disease, as shown by its chronicity and frequent relapsing, its multiplicity of lesions—erythematous patches, vesicles, papules, bullæ; its intense subjective symptoms—pruritus and burning pain, and its marked rebelliousness to treatment. Under these circumstances, it would be difficult to include the case in any other category than the one mentioned, even though its primary inducing cause was pregnancy

and not some other factor. My own cases of dermatitis herpetiformis—eighteen in number—have, however, shown me that there is not needed for the production of the process any one single or specific cause, but that in a person possessing a certain degree of predisposition almost any exciting factor may so disturb the equilibrium in the nervous system that the dermatosis develops. In fact, such diverse exciting causes as mental shock and emotion, malarial fever, the menopause, etc., have been in my cases the determining influence in the production of the process, and if these could act in that manner, there can be no objection whatever to regarding pregnancy in the same light. A further corroboration of the view that influences originating in the generative tract—of which pregnancy would be one—can be productive of the dermatitis herpetiformis of Duhring is furnished, moreover, by the following two cases of the disease, which have been under my care, and in both of which the menopause was the exciting factor.

CASE II. (Private practice).—Female, aged fifty-three years; seen by me in August, 1891. She stated that she had always enjoyed good health, although of nervous temperament, anæmic, and usually a little below par. Her menstruation had always been regular, but she had had ulceration of the os uteri for several years after the birth of her second and last child, twenty-nine years ago, and also ever since a most profuse leucorrhœa and a lacerated cervix. She was accustomed to take daily cold baths during menstruation, but not at other times. The climacteric began in April, 1889, the appearance of the menses becoming irregular, the flow scanty and finally ceasing, not to return, in July, 1890.

The cutaneous process first appeared in May, 1890, and since that time she has not been free from its manifestations, with the exception of two months, when she had an attack of erysipelas of the face and head. The disease was not so severe while the periods still came, but it became very much aggravated as soon as they had entirely stopped. The first lesions developed at the bend of each elbow as erythematous patches, which became covered with vesicles; then similar phenomena over the knees, then upon the back, and finally cropping out generally over the entire surface. Both halves of the body have always been affected, but the right half invariably more severely than the left. All these manifestations have been accompanied by the most intense pruritus and burning sensation, increasing at night and when in any way she became heated or excited. Since the primary outbreak the patient has experienced relapse after relapse, separated by longer or shorter intervals of comparative ease—papules, vesicles, bullæ, and more lately erythematous patches appearing in successive crops or more or less mixed together. Her general health has remained about the same, that is, she was not robust but could not complain of any particular illness. When she came to me, constipation was present, and she stated that for some time she had passed urine very frequently and abundantly, and had occasionally noticed a "brick-dust" sediment. The urine on examination showed the presence of urates, uric acid, and oxalate of lime crystals, but no albumin, sugar, or renal epithelium or casts.

The cutaneous efflorescences were distributed generally over the entire

surface of the body, the mucous membranes of the mouth and vagina being entirely free, and having always been so. They consisted of groups of papules or papules and vesicles, while here and there were single pea-sized bullæ, or a group of several of these, and widely distributed were discrete and grouped small and large areas of pigmentation, the sites of former lesions and groups of lesions. The vesicles were for the most part flattened, angular, and irregular in shape, quite resistant and not rupturing easily, and the bullæ presented very much the same characteristics, though on a larger scale. The pruritus and burning pain were complained of intensely, as they deprived the patient of sleep and rest. Since the case has been under observation there have been periods of improvement and others of aggravation; crops of lesions having the characteristics mentioned above have succeeded each other at irregular intervals, the patient at times covered with the eruption, at others presenting only a few groups of vesicles or papules and bullæ; but yet the agonizing subjective sensations have persisted without change or abatement, and only temporary relief has been obtained from treatment.

In January, 1892, she experienced a most intense relapse, which developed immediately after taking "laughing gas" for the extraction of some teeth. More lately (March, 1892), another severe outbreak manifested itself, after grief and the natural emotion caused by the death of her mother. On the whole, it may be said that there has not been any material change in the patient's cutaneous disease since its inception.

CASE III. (New York Skin and Cancer Hospital; Dr. Bulkley's service.)—Female, forty-eight years of age; first seen by me in January, 1889. She had been married twenty years, but had never become pregnant. She had always been of neurotic temperament, easily frightened, subject to attacks of melancholia, and a sufferer from severe neuralgias—facial and occipital—for twenty years. The inception of the menopause was dated by her in April, 1886, and her last period had occurred in May, 1887. The earliest cutaneous symptom noticed by the patient was a most severe burning and itching of the entire skin, which came on in the first part of June, 1887, and which at the end of from two to three weeks was followed by the appearance of bullous elevations as large as a 25-cent piece, first on the legs and then on the arms. While these were still present, outbreaks of papules and vesicles began coming out and have kept appearing in rapidly-succeeding crops, but no bullæ have reappeared. When the case was seen by me the process had been in existence about eighteen or nineteen months, and it had become universal. There were groups of papules and of vesicles of variable size, erythematous patches and pigmented areas distributed without arrangement over the entire cutaneous surface, which, in addition, was thickened and infiltrated and scratched in every direction. The burning pain and pruritus were intense and paroxysmal in character, and during the paroxysms the patient suffered from excessive thirst and consumed large quantities of water.

While the patient remained under observation the dermatosis pursued the same course as it had hitherto, that is, successive crops of vesicles, papules, or areas of erythema would appear, preceded or accompanied by the same severe subjective symptoms. No abatement or relief seemed to be obtained from treatment, and when she was last seen the process was in every particular *in statu quo ante*.

We thus find in these two cases the same major clinical characteristics as were observed in the one which primarily developed under the influence of pregnancy, and, in fact, in their entirety they agreed accurately with the latter, though differing from it in their initial moment of causation. I do not think that there can be any doubt but that Cases II. and III. were examples of dermatitis herpetiformis of Duhring, inasmuch as clinically their mode of behavior, their objective and subjective symptomatology were precisely such as pertain to that of dermatosis; and this being the case, it cannot but be evident that the process can and does originate under the influence of conditions, other than pregnancy, existing or arising in the generative organs.

It would appear to me justifiable to ascribe to the climacteric the rôle of being the exciting cause of the dermatosis in these two cases, for the reason that, notwithstanding the existence of a neuropathic condition in the patients, of a lowered nervous and general systemic tone for a long period of time, yet they were able to withstand all the noxious influences surrounding them and in operation, and they succumbed only after they had been subjected to the additional severe strain produced by the manifold changes occurring in connection with the menopause. The clinical history given by these cases would lead me, therefore, to regard all these factors existing for years prior to the climacteric as instituting a predisposed condition of the general system, while the menopause itself acted similarly to a nervous shock or mental or moral emotion—that is, as the determining cause which produced the final changes necessary for the development of the disease. In what manner the pregnant uterus or the climacteric act in calling the dermatosis into existence, it is difficult to state, except speculatively. In view, however, of the manifold neurotic disturbances which arise under the influence of these conditions, there are strong presumptive reasons for believing that the action of these exciting causes is through the nervous system, their effects being manifested in a reflex manner, and the cutaneous symptoms being simply an objective expression of a neuropathic condition induced by the disturbances having the uterine and generative organs for their seat. It would certainly appear as though the nature of the influences under which the process in Case I. continued after the miscarriage, demonstrated that the dermatosis was the outcome of disturbed conditions induced in the nervous system; besides this, the clinical history—to judge from the constant aggravation and relapsing of the dermatosis upon the repetition and recurrence of the same influences—pointed out that a most intimate connection existed between the objective and subjective symptoms and any and all disturbances taking place in the nervous system; or, in other words, the cutaneous manifestations were purely the objective expression of the neuropathic condition. No better proof of this view can be desired than

was furnished by this patient's case, since the disease persisted without change as long as those influences operating upon the nervous system lasted, but disappeared after their removal and cessation, the woman regaining her health and remaining free from the dermatosis. A stronger proof, I repeat, of the neurotic nature of the process than this could not, in my opinion, be obtained; and it is one which I have observed in a number of my cases, in which similar conditions were in action, and in which removal of these latter was likewise followed by entire relief from the process; when they recurred, so did a more or less extensive relapse become manifested. In Cases II. and III. similar observations were made as in Case I., though in a minor degree; that is, independent of the climacteric, influences in the former similar in nature to those noted in the latter excited likewise the same effects, and were followed by relapses, etc. In these two cases, the material conditions of the patients were better than in Case I., so that the repetition of the neurotic disturbances was not so frequent nor so intense in character, but, nevertheless, their occurrence would be invariably signaled by outbreaks and aggravation of the cutaneous symptoms.

When these facts are repeatedly observed, and not alone in these three cases, but also in many others, and they are taken in conjunction with the neuropathic etiology furnished by the majority of the patients, with the intensely marked evidences of disturbed sensory innervation—pruritus, burning pain, neuralgias—invariably present, it certainly seems to me that there is every reason and ground enough to conclude that the process is a dermato-neurosis, the outcome of disturbances produced in the nervous system by one cause or another. In another article upon this subject I have already committed myself to that belief, and certainly the more cases of the disease that I see and the more I study the dermatosis, the more convincingly do the array of facts presented by them strengthen and corroborate the opinion expressed.

In regard to the treatment of dermatitis herpetiformis, my experience has certainly shown me that there are no drugs which exert any influence upon its manifestations. In view of the conditions under which the cases originate and their behavior after development, this failure is what would be expected; so that, beyond remedying whatever functional or other disturbances of health which may be present or arise in the course of the disease, I can see no result to be obtained from the administration of medicines. Of course, if the etiological elements of causation can be reached by drugs, then certainly those indicated should be exhibited; but, unfortunately, such cases have not come under my observation. On the contrary, the only good results which have been obtained by me have been in such cases as permitted the removal and avoidance of all influences, surroundings, or circumstances which acted in any way detrimentally upon the nervous system, or caused a disturb-

ance of whatever nature in it. In consequence, the treatment should, in my opinion, rest upon the basis of the case's etiology, and be directed with a view to guarding the patient from every emotion, shock, or occurrence which might act in the manner mentioned. If this cannot be done, I would not expect the dermatosis to be helped, but to continue indefinitely, relapsing and recurring as often as the patient was exposed to one or another of such influences, though it is perfectly possible that in some instances the process may terminate of its own accord, the individual ceasing to react to the causes mentioned as primarily being so actively determinative of the eruption. As evidence I would advance, besides the two cases previously reported by me,¹ Case I. in this paper and Cases I. and IV. in another article already published.² In these, the clinical histories show that the patients got well when the influences surrounding them were removed or guarded against, but not before, notwithstanding that medication of all kinds was made use of. On the other hand, Cases II. and III. in this paper, and two others in the one just referred to, have persisted and continued irrespective of treatment, and in them it was not possible to remove or prevent the repetition of the various factors and other circumstances productive of the relapses. It seems to me, therefore, that the disease has to be dealt with upon the broad therapeutical basis mentioned, and its treatment not limited to the exhibition of one drug after another; rather let entire attention be given to the removal of all the etiological exciting and determining factors appearing to participate in the production and persistence of the process.

Locally, a certain amount of benefit can be obtained from treatment, in so far that relief from the distressing and oftentimes agonizing subjective symptoms can be given. The eruption is also by this means to a certain extent diminished in severity, by lessening the scratching and wounding of the skin by the patient—thereby increasing the inflammatory changes. Ichthyol has given me by far the best results of all substances used or tried, and patients have invariably obtained so much relief from its application that they have strongly objected to any change being made. I have not, however, observed that it had any influence in preventing new outbreaks or had any other action but that of giving relief to the intense suffering caused by the pruritus and burning.

¹ Journal of Cutaneous and Genito-Urinary Diseases, September, 1891.

² "Some Cases of the Dermatitis Herpetiformis of Duhring, etc.," New York Medical Journal, May 28, 1892.

THE QUESTION OF EARLY HIGH AMPUTATION IN SENILE GANGRENE.

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I AM able to adduce but a single case in illustration of the topic which I present for the consideration of my readers, and that case a fatal one. It serves, however, to emphasize the one point to which I invite your attention, namely, that in cases of senile gangrene involving the lower extremity, early recourse should be had to amputation through the thigh when the process has extended from the toes to the foot.

Mr. D., a heavily built man, aged sixty-seven years, was referred to me on Sept. 15, 1891. He had suffered with syphilis in early manhood, but had had no later manifestations. He had used alcoholics to a moderate degree. Four months before seen he had been troubled with slight itching on the dorsum of the right foot. Some months previously this had given place to dull, undefined pains in the foot and leg, slight at first, but later becoming so severe as to prevent locomotion. Areas of diminished and lost sensation had in turn appeared, and when coming under observation the entire foot was without surface sensibility, livid, cold, its dorsum covered with occasional blebs. The leg, as far up as its middle, showed scattered areas of insensibility and patches of a lightish-purple mottling, there being, however, no distinct line of demarcation. No evidence of recent or old injury to the toes or foot could be found.

There was no pulsation to be felt in either of the tibials, in the popliteal, or in the femoral at Hunter's canal. The latter vessel pulsated beneath Poupart's ligament. The heart-sounds were weak, but otherwise normal. The urine was negative upon examination.

The continuous pain had tended to weaken the patient's general strength; he had developed a slight daily fever.

Dr. William T. Bull kindly advised, commending immediate operation. Accordingly, thirty-six hours after I first saw him, amputation was made under chloroform through the middle of the thigh by antero-posterior flaps, care being taken that these should not contain an undue amount of tissue. The femoral artery was thickened, calcareous, occluded by a firm clot. It was secured with heavy catgut and did not pulsate after removal of the bandage which had been lightly placed about the thigh at the upper third. Occlusion did not, however, extend to the other vessels in the stump, all of which seemed competent.

Bleeding was checked in the usual manner and the stump closed, drained, and dressed in the customary way.

The operation was followed by no shock. Twenty-four hours afterward, however, respiration became labored. Physical examination revealed hypostatic pneumonia over both lungs below and behind, and the patient succumbed to this at the end of the third day.

An autopsy was not permitted, yet I was allowed to examine the stump and found it the seat of complete primary union.

The flaps were approximated throughout, there were no areas of malnutrition, and there was no pus.

Proposition to resort to early amputation through the thigh in cases of senile gangrene due to arterio-sclerosis was first seriously made by Jonathan Hutchinson,¹ who presented, in 1883, an exceedingly clear and forcible argument before the Medico-Chirurgical Society of London,² calling attention to the fact that amputation in obstructive gangrene due to arterio-sclerosis has been largely discountenanced because followed by sloughing of the stump, and urging that this only takes place when the part is removed too near to the disease.

When amputation is done at a low point the condition of the vessels will rarely be found to be such as to admit of repair; gangrene of the stump usually occurs immediately and places the patient's life in much more danger than before operation.

By the "high amputation" which he urges in these cases, he means that in the case of gangrene of the foot the amputation should be made above the knee, and in that of the hand, at or near the shoulder-joint.

In gangrene due to arterial calcification the interference with the blood-supply is usually greatest in the distal part of the arterial system, and is of such nature as to be steadily on the increase. Hence the hopelessness of improvement and the great danger of advance. Hutchinson adduces a number of cases in which he successfully amputated through the lower third of the thigh for gangrene of the foot, and avers that the procedure is not attended with much danger, even in advanced years and with most extensive calcareous degeneration of the arteries. He has never seen secondary hemorrhage in such cases, nor has he encountered difficulty in securing the vessels at the time of operation.

In this connection I beg to draw your attention to a recent and most instructive paper by Heidenhain,³ who, in September, 1891, published the cases of senile gangrene of the lower extremity which he had seen in the clinic of Küster at the Augusta Hospital in Berlin.

He makes prefatory reference to a paper by Israel,⁴ in which the latter arranges the conditions under which spontaneous gangrene occurs under three heads: 1. Imperfect access of normal blood to the affected parts; 2. Perfect access of abnormal blood; and 3. Imperfect access of abnormal blood. In the first category belong the cases of senile gangrene caused through arterio-sclerosis or obliterating endarteritis; in the second, those of gangrene of the tip of the nose, lips, toes, etc., after

¹ Mr. Hutchinson accredits earlier commendation of the measure to James.

² Medico-Chirurgical Transactions, 1884, vol. lxvii. p. 91.

³ Deutsche medicinische Wochenschrift, 1891, p. 1087.

⁴ Berliner klinische Wochenschrift, 1882, p. 705.

acute infectious diseases; while in the third class one must number a great part of the cases of diabetic gangrene, inasmuch as Israel found arterio-sclerosis in no less than 13 out of 20 diabetic patients who consulted him.

Heidenhain includes, then, cases of gangrene in diabetics as well as those in which the urine was free from sugar, citing 25 in all—11 with diabetes and 14 with simple arterio-sclerosis.

Thirty primary amputations were carried out on these 25 patients, three of whom demanded double amputation, and one triple. Besides these 30 primary amputations there were 10 secondary operations, the latter made necessary by gangrene of the stump following a primary amputation. Heidenhain says: "Küster had at first contented himself with the simpler form of interference, or low amputation. The constant occurrence of gangrene in the amputation wound, however, in these cases, regularly compelled further high amputation. So that he (Küster) is led, through his practical experience, to amputate at or above the knee in every case in which the gangrene has extended from the toes to the dorsum or sole of the foot."

Analyzing these cases we find that four times, in circumscribed gangrene of a toe, Küster disarticulated, but that in every instance gangrene of the flaps occurred and extended to the foot. Lisfranc's amputation was secondarily carried out on one of these patients; he developed further gangrene and died of sepsis. A second was further amputated at the knee and again higher, the latter operation accomplishing cure. Both of the others were healed only after amputation through the femur. In three cases of primary amputation through Chopart's joint, the gangrene progressed in two and required femoral amputation. Primary amputation through the leg was employed six times: one case died from gangrene of the flaps and sepsis; three were saved by amputation through the thigh; the other two were healed only after gangrene of the edges of the flaps and necrosis of the sawn surface of the bones. Of these 13 low primary amputations, only 2 went on to healing, these in leg amputations; 2 patients died of gangrene of the flaps and sepsis; the remainder, 9, were saved by secondary amputation at or above the knee.

Of the 17 primary amputations through or above the knee-joint, 9 were cured, while 8 died of diabetic coma or heart weakness. Of the 10 secondary amputations, all recovered. Separating, now, the diabetic from the non-diabetic cases, we find that of the 11 diabetic patients 6 were cured, while 5 died;¹ and of the 14 patients with simple

¹ It is worthy of note that three of these five fatal cases were in patients whose urine was both saccharine and albuminous. Of four patients whose urine contained albumin in addition to sugar, only one recovered, and he was a man in whom the amount of sugar, as well as of albumin, was small.

senile gangrene, 9 were cured, 5 dying. The fatal result was due to gangrene of the flaps and sepsis in two cases (one Lisfranc's amputation, one through the leg, both in the early days of antiseptis); in one case a man, aged eighty years, died at the end of nine days, from heart failure; one man, aged seventy-eight years, succumbed to hypostatic pneumonia; and another, aged fifty-two years, died at the end of nine days, with myocarditis, nephritis, and ascites. The list shows that through the high amputation all patients were saved who were not severely afflicted with some general disease.

Careful study of the cases of Hutchinson and Küster, together with the observation of others in which disaster has followed low amputation, serves to convince me of the wisdom of the course indicated, and in so far as we may be guided by present knowledge, I think that we may accept as authentic this statement of Heidenhain's:

"So long as the gangrene be confined to one or two toes, one may wait and abstain from other than general antiseptic treatment, with high position of the limb, allowing the part to be spontaneously thrown off. If the process extends, however, to the dorsum or sole of the foot, one should amputate above the condyles of the femur.

"Amputation below the knee is almost always followed by gangrene of the flaps, and brings the patient in danger. High amputation is indicated, then, when the gangrene progresses, even though the patient be without fever."

AN UNUSUAL CASE OF TUBERCULOSIS.

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E. H., Concord Street, Philadelphia, male, aged twenty-nine years. Of tuberculous family; general health had been good prior to July, 1888, at which time he had a small ischio-rectal abscess, which was opened by Dr. Hearn, and completed into a fistula, the second operation for which was made early in August of the same year. The fistula was slow in healing; otherwise his general health was good. He returned to his occupation, that of a clerk, and did not complain of any symptoms until February, 1890. About the middle of February he was taken with an acute attack of pleurisy, which presented some unusual characteristics. It affected more particularly the left side, the pain and friction being well marked at the apex, while the lower and anterior surface

of the pleura was the seat of well-marked and extensive dulness—so marked, indeed, that the effusion at one time almost demanded tapping; however, under suitable internal remedies and counter-irritation it disappeared.

There had been marked hyper-resonance over the right lung and apparently over the left apex; this now gave way to slight dulness over the left apex with crepitant râles. The evidences of pleurisy had disappeared, and the patient's general condition was so good that he failed to consult his professional attendant until the middle of June, when the following symptoms and physical signs were noticed.

The *symptoms* were slight pain over the left apex, not increased by inspiratory efforts nor by coughing; slight hacking cough, which did not annoy him very much and was attended by a very slight expectoration, at no time bloody, nor was it thick and muco-purulent in character. He complained of some shortness of breath on exertion, with decided hectic fever in the afternoons; had lost considerable flesh, but his appetite and digestion remained good.

The *physical signs* which presented themselves were as follows: Marked dulness over the left apex, extending downward as far as the fourth intercostal space, there were no respiratory murmurs to be heard over the dull area; the lower portion of the lung seemed to be hyper-resonant, although emitting some crepitant râles. In the third intercostal space, about one inch to the left of the sternum, was a soft nodule which gave distinct fluctuation and became tense and hard during any attack of coughing. The right apex might have been slightly dull, although no note was made of it at the time.

This examination was made on July 3, 1890; he was prescribed syrup of hydriodic acid in teaspoonful doses, three times a day; he bore this well, and returned July 27, very much improved, as he thought. At this time the physical signs did not seem to have changed; a heart note was made—no lesions could be noted. Treatment continued.

He was not seen again until August 13, when Dr. Coplin was summoned, and found the abscess had opened and discharged about two ounces of thick creamy pus containing small flocculi, slightly blood-stained. The opening through which it discharged was about as large as a pea, its edge thin and undermined, exposing to view the third costal cartilage, which was eroded and almost divided through.

This small opening communicated with a cavity about as large as a teacup, and could readily be made out, although its walls could not be discerned with any clearness. During the first twenty-four hours after the opening of the abscess no air passed in or out during the respiratory movements. However, on the second day after its opening the patient had a slight hemorrhage from the wound, amounting to one or two drachms and associated with slight hemoptysis; at the same time air was noticed to have entered through the opening, and from that time until his death whenever the opening was exposed respiration could be carried on entirely through it with the nose and mouth closed. His general condition seemed good, he was cheerful, had slight night sweats, appetite and digestion good, bowels regular, and his sleep very good, although at times annoyed by slight coughing. He had almost no expectoration.

About the middle of August Dr. O. P. Rex was asked to see the case. At that time there was a slight dulness over the right apex, with

no other evidences of further tubercular infection. The method by which he would empty this cavity was extremely interesting. He would seat himself on the side of the bed and take a large basin in his lap; he would then take a deep inspiration, leaning well back, followed by suddenly throwing himself forward over the basin, and, closing his mouth and nose, force the expired air out through the hole in his chest, bringing with it at least three or four ounces of thick tuberculous sputum; he would then feel relieved and lie down and enjoy an hour or so of quiet rest. The opening had now extended in size until it was as large as a silver half-dollar; the third costal cartilage, which had bridged the opening, was entirely destroyed and the two eroded ends could be seen at the inner and outer margins. With a bull's-eye lantern the large cavity could be readily seen, and its walls, posterior, external, and internal, could be easily made out. Extending across the cavity at various points, were remnants of bloodvessels or bronchial tubes, or possibly both, with branches jutting off in different directions, many of them uniting and some of them hanging as shreds from larger trunks; some of these showed saccular enlargements, and many of the saccular enlargements were open, showing small cavities inside, evidently communicating with other bronchial trunks through which air could be seen passing in and out. The cavity looked sufficiently large for the admission of two good sized fists.

Upon the floor of the cavity—that is, the inferior boundary—could be distinctly noticed the filling and emptying of the cardiac auricle; the filling could be distinctly noticed as synchronous with the pulse. This seemed to indicate that the auricle filled while the ventricle was emptying itself. Pulsation could not be observed in any of the branches which passed through the abscess cavity.

After the initial hemorrhage, which occurred shortly after the abscess opened, no further hemorrhages were observed. Many of the branches which traversed the cavity disappeared, and its opening gradually enlarged to nearly twice the size of a silver dollar. His general condition very gradually became worse, and death occurred on the 27th of October from exhaustion.

TREATMENT.—The treatment was entirely symptomatic. There were few symptoms which called for treatment; his cough rarely demanded it, and when it did, seemed to be relieved more by inhalation of one or two drops of chloroform upon a handkerchief held over the opening in the chest. The opening was kept surrounded and covered by corrosive sublimate gauze, and as at one time the discharge became fetid he was ordered a gauze moistened with a solution of eucalyptol, chloroform, and iodide of ethyl, each a drachm in four ounces of fifty per cent. alcohol, this controlled the cough and entirely removed the fetid odor. It was used only when occasion demanded it, and then for brief intervals, 15 or 20 minutes; it rarely produced any symptoms of anæsthesia and but slightly accelerated the heart's action.

LABORATORY NOTES.—The pus from the abscess was stained both by Gram's method and by the Koch-Ehrlich method; by Gram's method streptococci and staphylococci, also diplococci and bacteria were well

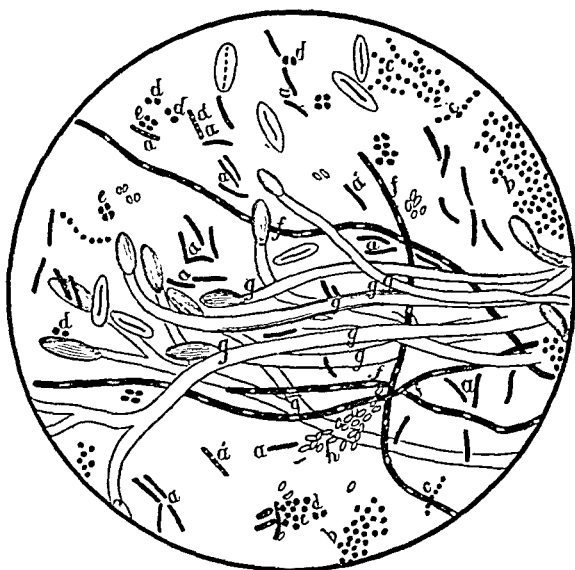
stained. These were afterward isolated and proven to consist of the following microorganisms :

1. *Streptococcus pyogenes*.
2. *Staphylococcus pyogenes*, *areus* and *albus*.
3. *Bacteria termo* and *lineola*.
4. Various forms of mould, not isolated.

A diplococcus was noted as present in the pus, but the culture experiments failed to isolate it.

By both Gram's and the Koch-Ehrlich methods the bacillus of tubercle was well stained and found to be present in large numbers. The sputum expectorated did not show the bacilli of tubercle until after the opening externally of the abscess, when they were present in large numbers, as well as in discharges from the abscess cavity. Numerous examinations were made of the sputum and discharge, the observations extending over several months, and at no time was there absence of the microorganisms above stated.

The accompanying cut shows the organisms present ; also the fact that moulds were growing in the abscess cavity ; these were proven to be members of the *aspergillus* group.



Beck's $\frac{1}{8}$ objective, homogeneous immersion, Oc. c, composite field ; camera lucida drawing.

a, a, a. Tubercle bacillus. á, á, á, Tubercle bacillus with spores (?). b. Micrococci in zooglæa. c. Streptococci. d. Diplococci. e. Tetracocci. f. Leptothrix. g. Mould fungi. h. Yeast fungi.

REMARKS.—While this case presents many features of unusual interest, its history, associated with minute study of the accompanying

process, shows that it is but an extraordinary combination of complex infective processes. It is to be assumed that the pleurisy which he had was plastic in character and firmly united the visceral and parietal layers of the apiceal pleura together, thus occluding the lower half of the left cavity from that portion of the pleura which covered the apex. That this pleurisy was tubercular in origin and associated with active tubercular processes in the apex is hardly to be doubted; these eventually becoming infected with microorganisms of suppuration (secondary infection), thus leading as an inevitable result to the development of pus, which extended and burrowed through the anterior chest-wall. One of the most interesting and at the same time most benevolent features of this unique pathological process is the fact that its walls so thoroughly limited and prevented its opening into some of the larger bronchi until an external opening had been provided; it is also a very remarkable occurrence in the fact that this extensive process was unassociated with any hemorrhagic development. Whether the ischio-rectal abscess was of tubercular origin or not cannot be definitely stated, as no examinations were made for the bacilli of tuberculosis. It is, however, to be presumed that the pulmonary process was probably caused directly from infection through a primary cheesy nodule or caseous mass somewhere else than in the lung itself; this, of course, cannot be proven.

It is extremely unfortunate that more minute observations could not have been made upon the cardiac condition, and if possible graphic representations of the inter-thoracic viscera have been made. It is also to be regretted that no post-mortem could be obtained.

REVIEWS.

A TEXT-BOOK OF THE PRINCIPLES AND PRACTICE OF MEDICINE. By HENRY M. LYMAN, A.M., M.D., Professor of the Principles and Practice of Medicine in Rush Medical College, Chicago. Philadelphia: Lea Brothers & Co., 1892.

WHILE a review of a text-book of the Practice of Medicine may be of value to one contemplating the perusal of such a work, it is to be remembered that there are no points of striking original merit to which attention can be called, in view of the fact that the only good Practice for the use of student and practitioner is one that presents a complete picture of the subject, without misleading or false statements, and containing all that is essential, including recent researches that have been or are being made at the time of publication. It will be seen, therefore, that not much can be said in reviewing a book of this character when the statement has once been made that the book is complete, accurate, and up to date.

The work before us consists of 926 pages, with many illustrations. Its general make-up is excellent, and the mechanical part of the execution leaves nothing to be desired.

Part I. is devoted to Preliminary Considerations, including chapters upon the organization of the body, growth and development, disturbances of nutrition, tumors, disorders induced by disturbances of the circulation, contagion and infective diseases, inflammation, and fever.

Part II. is devoted to the Parasitic and Infective Diseases. While it at first sight seems strange to find grouped together diseases so far removed—for example, as intestinal worms and pulmonary consumption—it is manifest that, if we agree with the general view as to the etiology of the eruptive fevers, dysentery, tuberculosis, etc., it is not so extremely out of the way to arrange many of the diseases caused by living animal or vegetable parasites together. It would, however, seem to the reviewer that the placing of diseases caused by intestinal parasites among intestinal disorders would be far more appropriate than inserting them in the same portion of the book with infectious diseases. There is certainly no such connection between verminous intestinal diseases and malaria as there is between dysentery and malaria. The animal parasites of the intestinal canal are, so to speak, outside of the body proper, and are so closely connected with local disorders of the parts concerned that the proper treatment of the parasitic disease does not, as a rule, complete the cure, the correction of the accompanying catarrhal condition of the mucous membrane being as important as the removal of the parasite itself. With dysentery the question is to a certain extent different, in that the truly infective character of the disease allows of its more properly being considered with such diseases as malaria. In the present volume the author connects the diseases due to the invasion of living

plants and animals by considering the intestinal animal parasites first; then the protozoön of malaria; by this leading up to dysentery, and this in turn being followed by actinomycosis, anthrax, typhoid fever, and so on through the list of infective diseases.

While he does not so state in positive terms, it is evident that the author believes in the now well-recognized plasmodium of Laveran as the cause of the malarial manifestations. In regard to the rôle played by the amœba coli in the causation of dysentery, the author is very cautious in giving an opinion, his reference to it being in the following terms: "In the tropics and elsewhere various forms of amœba have been identified in the colon and in the hepatic or pulmonary abscesses that sometimes complicate the disease, and they have been considered as its cause." With the diseases now generally supposed to be caused by bacteria, the author is much more positive in his statements as to their etiological importance. Full consideration is given to the facts at present known regarding acquired and artificial immunity.

Among the infective diseases the author includes the description of syphilis and tuberculosis in their various forms, so that, instead of describing cerebral and spinal syphilis and pulmonary and laryngeal tuberculosis among the diseases of the nervous and respiratory systems respectively, they are treated under the head of the general disease as localized in the different parts. This arrangement has many very decided advantages that are apparent after one has become used to this change from the former classification, whereby the general disease was treated of in one portion of the work and the specially localized forms of the same disorder under the various anatomical divisions. This classification is also much more in accordance with etiological facts, and permits the author to avoid much repetition and to give a connected account of the infective process as it involves various structures.

The thirteen remaining parts, into which the rest of the book is divided, deal with the diseases of the various systems of the body, each division receiving careful consideration.

Under the Diseases of the Stomach the author gives a full description of the various tests for determining the presence or absence of free hydrochloric acid, the peptogenic power of the gastric juice, the rate of absorption from the stomach, and the amount of the muscular power of the viscus. The chapters upon Diseases of the Intestines and organs of the chylopoietic system require no notice, being fully up to the requirements demanded by the importance of the diseases to which they belong.

Under Diseases of the Organs of Respiration the author considers fibrinous pneumonia, although he describes it as an infective disease. It is well, however, that the author has considered it in relation to the diseases that are closely connected with it anatomically, as the importance of the local lesion in the lungs is at present far greater than that of the general systemic disturbance, of which the former may be simply the outward and visible sign. In regard to the treatment of pneumonia, the author condemns the use of quinine, tartar emetic, veratrum viride, digitalis, and venesection as measures to be avoided. As the author makes no mention of the extreme danger arising from over-distention of the right side of the heart in this disease, it would seem that he has never witnessed the intense relief afforded by the loss of a small quantity of blood from the congested venous system when this unfortunate condition threatened life.

The portion of the work that deals with Diseases of the Circulation is divided into chapters upon endocardial diseases, diseases of the muscular substance of the heart, neuroses of the heart, diseases of the pericardium, and diseases of the aorta. Following a section upon Diseases of the Blood, Part VIII. is devoted to the Diseases of Nutrition, including rickets, osteo-malacia, obesity, diabetes mellitus, diabetes insipidus, gout, nodular rheumatism, acute rheumatism, alcoholism, morphinism, cocaineism, and chronic nicotinism. The classification of these diseases together avoids the usual absurdity of considering diabetes mellitus and insipidus among renal diseases, with which they have no possible connection, save only that the most characteristic changes in both groups are found in the urine. The portion devoted to renal diseases and to those of the urinary organs is full and carefully written. The last four parts are taken up with a consideration of Diseases of the Nervous System, being divided into sections upon diseases of the peripheral nerves, of the brain and its membranes, of the spinal cord, and functional diseases of the brain.

Looking upon the book as a whole, it may be said to fully carry out the purpose for which it was written: the giving of a reliable text-book of practice of medicine to the student and practitioner. F. A. P.

DIE ENTSTEHUNG DER ENTZÜNDUNG UND DIE WIRKUNG DER ENTZÜNDUNGERREGENDEN SCHÄDLICHKEITEN, NACH VORZUGSWEISE AM AUGE UNGESTELLTEN UNTERSUCHUNGEN. Von DR. THEODOR LEBER, Professor der Augenheilkunde an der Universität Heidelberg. Mit 8 lithographischen Tafeln und 2 Holzschnitten.

THE ORIGIN OF INFLAMMATION AND THE ACTION OF NOXIOUS INFLAMMATION-EXCITING SUBSTANCES, AS SHOWN IN INVESTIGATIONS INSTITUTED MOSTLY ON THE EYE.

Most German professors seem to think that their thoughts are better embalmed when presented to the public in weighty quartos, and, consequently, nearly all essays on election to university chairs, and anniversary mementoes of the retirement of noted professors from their posts as teachers, are spread out in huge volumes with wide margins. Prof. Leber is no exception to the rule, and soon after his transfer from the chair of ophthalmology in Göttingen to that in Heidelberg, has published the results of his eleven years of careful work in the study of inflammation in a quarto of five hundred and thirty-five pages, printed on heavy paper, and illustrated by eight lithographic plates and two woodcuts. All his previous writings, from that on the circulation of the blood in the eyeball to this treatise on inflammation, have shown careful and painstaking observation and thoughtful reasoning, and we were therefore led to expect a great deal from the present treatise; and we have not been disappointed.

In conducting his experiments on inflammation, the author has usually chosen the eyeball as the organ of the body in which to perform them, because in most instances the reaction produced does not

extend beyond the sclerotic coat, and because the progress of the inflammation in the cornea and iris can usually be advantageously studied during the life of the animal used for experiment. The substances selected to cause inflammation have been most varied in character, *e. g.*, the mould-producing fungi, the bacteria of decomposing fluids, the staphylococcus aureus, particles of iron, copper, lead, silver, gold, mercury, and arsenic, introduced into the tissues, and a long list of organic substances such as gamboge, indigo, quinine, croton oil, uric acid, etc. In experimenting with fungi and bacteria, pure cultures only were employed, and in the case of other material it was in every instance carefully sterilized and introduced into the eye with sterilized instruments, under the strictest aseptic precautions. Horner had already described a keratitis mycotica as occurring in man, and these experiments with mould fungi and the bacteria of putrefaction were therefore of direct practical interest. It was found that some fungi, such as penicillium glaucum, produced only slight and transient irritation, owing to their inability to exist and grow at the temperature of the rabbit's body. The alkaline reaction of the serum of the tissues is probably also unfavorable to the growth of many varieties of fungus. On the other hand, aspergillus fumigatus grew luxuriantly, and produced intense inflammation. If a portion of a pure culture of this fungus was inoculated in the centre of the cornea, it proliferated to some extent in the corneal tissue, causing a local necrosis and ulcer, and beyond this was a clear area, where the intensity of the poison secreted by the fungus caused a more gradual death of the corneal tissue. This area was absolutely free from either fungus or from pus corpuscles, while in it also the corneal corpuscles were also shrinking and dying. Beyond this necrotic area and surrounding it was a ring densely packed with leucocytes. At this stage there was also marked inflammation of the iris and ciliary body, the pupil becoming plugged with lymph, and the iris being covered with fibrinous effusion both on its anterior and posterior surfaces, while the pectinate ligament and ciliary processes were crowded with leucocytes. When the fungus is introduced into the anterior chamber, a violent irido-cyclitis is produced, but no mycelium is found free in the anterior chamber. On its non-vascular walls it develops, however, being found in the membrane of Descemet and in the anterior capsule of the lens. The layers of the cornea anterior to the membrane of Descemet were full of fibrinous exudation, but free from all traces of aspergillus. When a small portion of the aspergillus fumigatus was introduced into the vitreous, there followed a proliferation of mycelium throughout its tissue, with the production of pus in the retina and choroid, and eventually, also, in the anterior chamber, although no mycelium was found in the latter situation. An injection of a neutral watery extract of aspergillus fumigatus into the cornea also produced inflammation, but in a lower grade than that caused by the living fungus. One of the most interesting of the conclusions arrived at by Leber is that the intense suppurative inflammation caused by the introduction of the staphylococcus aureus into the eye is due to a poisonous principle produced by these microbes, and that this chemical agent can be extracted from them, and will then, in turn, give rise to intense suppurative inflammation. Pasteur has already found that boiled cultures of the staphylococcus would produce active inflammation. Leber confirmed this result, and found, further, that such decoctions when treated with ether yielded a crystalline principle, called

by him phlogosin, which, when introduced into the tissues, produced local necrosis, and the most violent surrounding inflammation. The pus produced either by the use of the decoctions of the staphylococcus or by the phlogosin was in either case absolutely sterile and non-microbic, as proved both by repeated careful attempts at culture in different materials, and also by the most thorough microscopic investigation, after staining with fuchsin. Either sterilized mercury or sterilized croton oil injected into the anterior chamber caused a limited purulent irido-cyclitis, with destruction of a part of the deeper corneal layers and the production of an *internal* corneal ulcer.

Clinical experience has long since taught us that very minute pieces of metal, if entirely aseptic, may remain in the anterior chamber for a long time without exciting any notable reaction. Leber proved by experiment that small aseptic pieces of glass and metal would often become coated with an exudation, consisting mainly of proliferated endothelium and of giant cells, and thus coated remain harmless. In one instance, a piece of steel needle introduced into the anterior chamber lay there for over a year with very little irritation, and finally, in five hundred and twenty-seven days after its introduction, was spontaneously evacuated through the wound of entrance. On the other hand, even substances like glass and gold, when in a state of minute subdivision, appear to undergo slow solution and to exercise an irritative and deleterious action on tissues. Thus finely powdered aseptic gold injected into the vitreous produced a slow contraction of the retinal arteries, the veins being in like manner affected, but to a less degree, while there was swelling of that part of the retinal fibres which retained their marrow sheath (rabbit's eye), and final atrophy of the fibres. These changes were accompanied by alterations in the distribution of the pigment in the retinal epithelium, causing the eye-ground when examined by the ophthalmoscope to appear marbled. Similar but more marked changes followed more rapidly from the introduction of copper, lead, iron, etc., into the vitreous. Arsenic seems to have a marked necrotic influence on the adjacent tissues. All these changes would appear not to be due to any mechanical action of the foreign substances thus introduced, but to a gradual solution of them by the fluids of the economy and the irritant action of the solution on the tissue. In every case they were more marked when the metal was introduced in a state of minute subdivision. The action of jequirity was also noteworthy. A large piece of a bean of the *Abrus precatorius* introduced into the anterior chamber of a rabbit's eye caused the death of the animal, with marked congestion of the lungs and kidneys and with extravasations of blood into the mucous membrane of the stomach and bowels. A smaller quantity of the drug produced a diffuse opacity of the cornea, with swelling of the lids and the well-known characteristic exudation on the surface of the conjunctiva. Leber considers that this action is due to jequiritin and not to the action of microbes. The slight effect of uric acid introduced into the anterior chamber of rabbits' eyes is noteworthy. It was rapidly absorbed, causing but little inflammation. This was contrary to what might have been expected, because, in the experiments of Ebstein on birds, where he caused retention of uric acid by tying the ureters, the tissues infiltrated with it subsequently underwent necrosis. As already mentioned in speaking of the action of staphylococcin, so in numerous experiments with other substances we have abundant and repeated evi-

dence of the possible occurrence of severe non-microbic inflammation and suppuration, the most careful culture experiments and searching microscopic examination failing to prove their presence, either in the tissues or in the pus corpuscles. The main clinical difference between microbic and non-microbic inflammation and suppuration seems to be that the former, owing to the continued secretion of irritant substance by the microbes, is of longer duration, more intense, and extends further into adjacent tissue. Purulent softening and disintegration in inflamed parts, or, as Leber terms it, histolysis, is, according to our author, but little due to any phagocytic action of the leucocytes, but mainly to the formation of a peptone by them, by which the tissue is gradually digested and dissolved. In this view he is substantiated by the experiments of Bitter, and, after him, of Rietsch, who have shown that in the case of the cholera bacillus and in the case of the staphylococcus, after the destruction of the microbes an enzyme may be produced capable of dissolving fibrin in neutral solution by the formation of a peptone. While recognizing fully the regenerative processes in the tissues in the neighborhood of inflamed parts, where, by subdivision of their proper cells, new tissue of a similar sort is produced, nevertheless our author does not sufficiently believe in the doctrines of natural selection to admit for a moment that any descendant of a tissue-cell can contribute to the formation of pus, and on the other hand he is very doubtful whether any leucocytes can ever themselves be converted into fibrin tissue. In short, according to Leber, inflammation is an effort of Nature to expel some noxious and irritating substance. It is made up of a series of individual processes, all tending to the same end. Such are the exudation of serous and fibrinous fluids, the emigration of leucocytes, and the proliferation of neighboring tissue in the effort at repair. The leucocytes, by their phagocytic and peptone-forming power, tend to carry off and dissolve noxious substances and to cause softening and disintegration of tissues.

Having thus glanced at a few of its salient points, we take leave of a most instructive book, which is a perfect storehouse of careful and painstaking observation, and which affords ample food for reflection to every physician and pathologist.

W. F. N.

CONTRACTIONS OF THE FINGERS AND "HAMMER-TOE." By WILLIAM ADAMS, F.R.C.S. Eng., Consulting Surgeon to the Great Northern Hospital, the National Hospital for Paralyzed and Epileptics, and the National Orthopædic Hospital; late President of the Medical Society of London, and of the Harveian Society; also Vice-President of the Pathological Society. With eight plates and thirty-one wood engravings. Second edition. 8vo., pp. 154. London: J. & A. Churchill, 1892.

THIS volume includes five essays, the first and last of which appeared as a first edition of the present work in 1879, while the remainder are reprinted from periodicals of more recent date.

The essay upon Dupuytren's contraction of the fingers and its successful treatment by multiple subcutaneous divisions of the palmar fascia and immediate extension is reprinted substantially as it appeared in the first edition. This monograph has become one of the several classics of

orthopædic surgery that have emanated from its venerable and renowned author.

The second essay is devoted to the same subject, and contains Mr. Adams's views as revised up to the year 1890. Here much credit is given to the work of Keen and Abbe, but the theory of neurotic origin advanced by the latter has not shaken the former enunciation of the writer, that the principal cause of Dupuytren's contraction is the gouty diathesis, and that "the local changes depend essentially upon a gouty thickening of the palmar fascia and its digital prolongations." Operation alone is recommended as local treatment. Every contracted band of fascia should be divided by subcutaneous puncture with a fascia or tenotomy knife, and subsequent gradual extension on splints practised for weeks or months. A small percentage of relapses by this method are recorded. The open method of dividing the band is unqualifiedly condemned, but no mention is made of the method of excision of the fascial bands that has been carried out by certain American surgeons with success.

The third essay deals with congenital contraction of the fingers and its association with "hammer-toe." Here that peculiar congenital contraction of the fingers incident to a contracted condition of the skin and fascia, and partially to atrophy or want of development of the articular ligaments, but wholly different from Dupuytren's contraction, is interestingly discussed, and its close similarity to and frequent conjunction with "hammer-toe" pointed out. Division of all contracted fascial bands, including those entering the skin, by subcutaneous punctures and subsequent extension upon a splint is urged as the best treatment.

In the fourth essay it is shown that "hammer-toe" is probably always an hereditary affection, and is produced by contraction or lack of development of the lateral ligaments of the second, and occasionally of the third phalanx of one or more of the toes, never by contraction of the tendons. Operation will alone give relief, and should consist of division of the contracted ligaments by subcutaneous puncture. This failing, as it rarely does, the head of the proximal involved phalanx should be excised.

The fifth and final essay relates to the obliteration of depressed cicatrices by subcutaneous division of their deep attachments with a fascia knife inserted through one or more punctures, and then raising the depressed portion upon hare-lip pins passed beneath and allowed to remain for several days. By this procedure, the author states, he has been able to obliterate many disfiguring scars.

The plates and woodcuts of this volume, in the main satisfactory, present many types and varieties of the various deformities described in the text which are not to be found elsewhere. T. S. K. M.

CHARAKA-SAMHITA. Translated into English. Published by ABINASH CHANDRA KAVIRATNA, Editor of *Susruta-Samhita*, and of *Chikitsa-Sam-mālani*; Practitioner of the Hindu System of Medicine. Parts I., II. Pp. 88. Calcutta, 1890-92.

THE translator has placed those interested in historical medicine under deep obligation by his making accessible the wealth of ancient

and mediæval medical literature of India, of which this work is an excellent example. Translated and studied by the Arabians in the days of Harun and Mansur (A.D. 775), Charaka bears internal evidence that it is of a much more ancient date. Whether a commentary upon a work of an earlier time, and one that has been entirely lost, or of an independent origin, it is to-day a most comprehensive treatise upon disease and the general conditions of health, written in an inimitable style and containing many aphorisms of striking truth and wonderful beauty. "The physician conversant with the right application of medicines occupies a place above that of persons conversant with the mere properties of drugs." "Well applied, a virulent poison even may become an excellent medicine, while a medicine misapplied becomes a virulent poison." "That is the right medicine which can cure, and he is the best of physicians who brings about recovery." There are many instances of words of pregnant wisdom, unsurpassed in brevity and deeply philosophical. It is almost with such a feeling as one experiences who gazes upon the sculptured ruins of a bygone civilization, that we read the records of intelligent empiricism and the results of incisive logic. The ancient people of India, the most philosophic branch of the Aryan race which has given to the world its literature and science, have made contributions to medicine that to-day are recognized as some of the highest and latest discoveries of hygiene, and it is not unlikely that this translation may bring about changes in the modern systems of treating disease. Without instruments of precision; physiology and chemistry, as we apprehend them to-day, unknown, we cannot but be lost in amazement and admiration when we read the results of their industry, patience, and learning. We need not consider that all that is of real importance in therapeutics can have its history limited to the past three centuries, for nearly every page presents drugs well known in modern *materia medica*. As examples: *rishabhi*, *mucuna pruriens*; *chandana*, *pterocarpus santalinus*; and of remedies which the journals designate as new we find *vidanga*, *embellia ribes*; and *jambu*, *syzygium jambolanum*. The graceful diction, and the excellence of the translation, are indeed worthy of commendation.

R. W. W.

ESSENTIALS OF DIAGNOSIS. By SOLOMON SOLIS-COHEN, M.D., Professor of Clinical Medicine and Applied Therapeutics in the Philadelphia Polyclinic; One of the Physicians to the Philadelphia Hospital; and AUGUSTUS A. ESHNER, M.D., Instructor in Clinical Medicine in the Jefferson Medical College and in the Philadelphia Polyclinic, Registrar in the Neurological Department of the Philadelphia Hospital. Pp. xvi., 359. Philadelphia: W. B. Saunders, 1892.

THIS work, arranged in the form of questions and answers, and intended especially for students of medicine, should have a wider field of usefulness. Concise in the treatment of the subject, terse in expression of fact, cleanly-cut in statement, it presents to the student the essentials of diagnosis in a form which will aid their acquisition as a part of his medical knowledge. The brevity of each answer will appeal to

the practitioner who may need to refresh his memory or to formulate in his mind a modern and accurate definition. While the book is designed to facilitate true methods of study, and, as the authors modestly state, is an outline to be filled in from observation and reading, we believe that the student who has faithfully studied this compend has done more than to lay the foundation—he has reared a substantial superstructure of diagnostic knowledge. The work is reliable and represents the accepted views of the clinicians of to-day. The statement as to the means of distinguishing membranous croup from diphtheria, that “until the physician acquires sufficient experience to warrant a personal opinion, he had best consider all cases of membranous croup diphtheritic,” is undoubtedly true, but it will hardly be accepted as an answer to the question. With few exceptions, we believe that the student will in every instance find this work helpful and of very great value.

R. W. W.

RECHERCHES, CLINIQUES ET THÉRAPEUTIQUES, SUR L'ÉPILEPSIE, L'HYSTÉRIE ET L'IDIOTIE. Compte-rendu du Service des Enfants, Idiots, Épileptiques et Arriérés de Bicêtre pendant l'Année 1890. Par BOURNEVILLE. Paris: Publication du Progrès Médical, 1891.

CLINICAL AND THERAPEUTIC RESEARCHES UPON EPILEPSY, HYSTERIA AND IDIOCY. By BOURNEVILLE.

THE book before us consists of a detailed report of the institution of Bicêtre for idiots, epileptics, and feeble-minded children, for the year 1890. In it is also embodied a report on the “Fondation Vallée” (the Vallée endowment).

The volume is divided into three parts. The first deals with the general details of the hospital service and with the instruction of the children. The instruction is of two kinds: *primary* and *professional*. For the purposes of primary instruction the children are classified as follows:

1. Idiot children, incontinent, epileptic or not, but who are physically feeble (invalides).
2. Idiot children, incontinent or not, epileptic or not, but physically strong.
3. Children who are well, but imbecile, feeble-minded, epileptic and hysterical or not.

The first group is divided into two categories: The first comprises those idiots who are incontinent, who neither talk nor walk, but who are, for the most part, susceptible of amelioration. They are taught to stand by the aid of parallel bars, and to walk either by holding them under the arms, or by the aid of a carriage. Their limbs are strengthened by alternately flexing and extending them, and by stimulating friction. When they are able to walk they are sent to the “petite école;” at first, and for some time, during the morning, and later for the whole day, as their strength permits. The second category comprises those idiots who are altogether incurable and those epileptic children who have become incontinent and demented as a result of their attacks. They are, as a rule, merely the object of hygienic care.

The second group of idiot children frequent the "petite école," which is exclusively under the care of women. All of the children are sent to the "petite gymnasium," except those who are too infirm to take part.

The instruction, as formerly, consists in the treatment of the incontinence (by placing the child at regular hours on the closet), in toilet lessons (washing the face and hands, combing the hair, blacking the shoes, etc.), in exercising the hands (closing and opening them, working the fingers, stretching, extending and flexing them—together or separately), in gymnastics, in object lessons, in education of thought and speech (exercise in pronunciation), etc.

The children of the third group visit the "grande école." Both the children of the "petite école" and of the "grande école" make numerous visits to places of interest in Paris or the neighboring districts—*e. g.*, Luxembourg, Jardin des Plantes, Parc de Montsouris, Place de l'Hôtel de Ville, du Lion de Belfort, Bois de Vincennes, Musée du Louvre, Jardin d'Acclimatation, and elsewhere.

Professional instruction is given in carpentry, tailoring, blacksmithing, shoemaking, brush-making, basket-making, wicker-work, chair-caning, and printing.

The "Fondation Vallée" owes its existence to a former instructor of the hospital of Bicêtre. In plan of management and instruction it closely resembles the Bicêtre itself. The Bicêtre had, in 1890, a population of 372; the Fondation Vallée, 69.

Part II. of the report consists of a clinical and pathological study of seven cases, in the preparation of which Bourneville was assisted by several of his internes. The cases, while in themselves interesting, would hardly merit abstracting in a mere review. They include cases of atrophy, sclerosis, meningo-encephalitis, cerebellar tumor, tubercular disease, and arrested development.

Part III. consists of four papers, three of which were originally communicated to the International Congress of Mental Medicine in 1889, and one to the National Congress of Alienists in 1890. Their various subjects are classification, microcephaly, porencephaly, and myxœdematous idiocy. The one on classification alone deserves mention here. Bourneville attempts an anatomo-pathological classification of idiocy as follows:

1. Idiocy symptomatic of hydrocephalus (hydrocephalic idiocy).
2. Idiocy symptomatic of microcephaly (microcephalic idiocy).
3. Idiocy symptomatic of an arrest of development of the convolutions.
4. Idiocy symptomatic of a congenital malformation of the brain (porencephaly, absence of corpus callosum, etc.).
5. Idiocy symptomatic of a hypertrophic sclerosis.
6. Idiocy symptomatic of an atrophic sclerosis.
 - a. Sclerosis of one or both hemispheres.
 - b. Sclerosis of one lobe of brain.
 - c. Sclerosis of isolated convolutions.
 - d. Scattered sclerosis of brain (?).
7. Idiocy symptomatic of chronic meningitis, or meningo-encephalitis (meningitic idiocy).
8. Idiocy with "cachexie pachydermique," or myxœdematous idiocy, associated with absence of the thyroid gland.

The book is well illustrated, and, as a hospital report, is a model, both from a lay and a scientific standpoint.

F. X. D.

THE USES OF WATER IN MODERN MEDICINE. By SIMON BARUCH, M.D., Attending Physician to the Manhattan General Hospital and New York Juvenile Asylum; Consulting Physician to the Montefiore Home for Chronic Invalids, etc. 12mo., pp. xv., 228. Detroit, Mich.: Geo. S. Davis, 1892.

DR. BARUCH has laid the medical profession in America under obligation, not alone for his persistent and well-directed advocacy of hydriatric measures in suitable cases of acute and chronic disease, but for gathering into a small compass, and presenting in a clear, accurate, and readable manner, the principal facts necessary for the understanding of hydrotherapy, and for its proper application in the art of medicine.

The absence of an index is to be regretted; as is likewise the presence of numerous apologetic passages, which, however true and just, are unnecessary, and interfere with the systematic presentation of the subject. We trust they will be omitted in future editions.

The object of the work, as stated in the preface, "to sever hydrotherapy from any connection with 'hydropathy' or 'water-cure,'" is well carried out. It is indeed strange that there should have been any need for this. No intelligent physician confounds electro-therapy with "electropathy," or the judicious use of oxygen with "oxygen-cures."

It is true, however, that accurate knowledge of the technique and range of usefulness of water as a remedial agent is not common among American physicians; and sober statements concerning results obtained by its judicious use are often received with polite incredulity. Dr. Baruch's book, which renders accessible in English much practical information hitherto only to be obtained by wading through the forbidding pages of an uncouth translation of Winternitz, should go far to correct this. Not that the work before us is merely or principally an abstract of Winternitz' treatise; it adds much that has developed since the date of the latter publication, and is enriched throughout by the fruits of the author's experience; while not only is the method of presentation of the facts original, but critical judgment has carefully weighed in its own scales every recommendation made or direction given. Dr. Baruch properly insists upon precision in the use of water as in the use of any other remedial agent. To tell a patient to "wrap himself in a wet sheet and get some one to rub him" is about as wise as to tell him to take "some opium." Temperature, time, details of technique, must be accurately prescribed, and the physician must satisfy himself that the prescription is faultlessly carried out. The descriptions of the methods of applying water in the treatment of disease are full, and no detail has been forgotten. The indications for use of special procedures are judiciously considered, and the counter-indications fully set forth. Water is not a panacea in the author's hands—it is one among many agents to be employed intelligently in suitable cases; and, so employed, capable of doing much that cannot be otherwise accomplished. Considerable space has been wisely devoted to a critical study of Brand's method of treating typhoid fever. We thoroughly agree with the author in a high estimation of its usefulness.

While we differ from the author on some minor points, we can cordially commend the book to the careful study of every practitioner.

S. S. C.

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

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THE TREATMENT OF CHOLERA.

M. G. DAREMBERG believes that the water should be pure. Filtration by charcoal or sand is ineffectual. While porcelain filters separate the microbes, they require careful attention and should be thoroughly and frequently cleansed, using a weak solution of vinegar. Boiling the water—in spite of the cost, the dissipation of gases rendering it less agreeable for drinking, and the precipitation of the carbonates—is the best way of rendering water harmless. Sterilization or complicated apparatus is unnecessary when simple boiling answers the purpose, but the water should be used at once; chemical purification can be accomplished with small quantities of alum (15–20 to 1000), which clarifies the water and frees it from microbes after standing twenty-four hours. In time of cholera he advises the use of citric acid (60–80 to 1000), which is not expensive and does not render the water disagreeable. Tartaric or even hydrochloric acid can be substituted. The water used for cooking, cleansing the hands, face, and mouth, should be sterilized, and the food should not be touched with the hands. Artificial ice should not be used unless made from purified water. General measures against the contagion are to prevent the spreading of fecal matter upon the soil or in streams; not to tolerate unsanitary dwellings; to drink only spring water; to disinfect by heat, sublimate, or carbolic acid, the clothing, property, and utensils of those suffering from cholera; and to treat these patients in special hospitals. Milk should be boiled, or better, sterilized in Soxhlet's apparatus, if it is to be preserved for twenty-four hours. Butter should be avoided. Fruits and vegetables which have touched the earth should not be eaten raw. Excessive fatigue and chilling should be avoided; one should be well protected day and night; it is prudent to wear a band of flannel. A regular diet is important, and indigestion is to be avoided; a good supply of normal gastric fluid contains acid which is a protection against cholera, because the microbe is killed by acids. Cholera is

transmitted by contact, therefore all contact with patients, their attendants, utensils, or clothing may result in infection. Frequent washing of the hands is of incontestable usefulness. Brushing the teeth several times daily with a brush moistened in boiled water, followed by washing the mouth with water containing citric acid, is important. Disinfected water should be snuffed through the nose. One should keep away from sewers and from streams polluted by sewage. In a word, cleanliness and temperance will give but little opportunity for becoming the prey of this disease. If in a house with cholera, all stools, urine, vomited matter should be treated with one to four teaspoonfuls of commercial sulphuric acid. All vessels should be washed with a 2 per cent. solution of this acid. All clothing and linen should be placed in boiling water for a quarter of an hour, then soap should be thoroughly brushed into them. The attendants should wash their hands in a 1 to 10,000 solution of corrosive sublimate, to which one-tenth of 1 per cent. of hydrochloric acid is added, or with a weak solution of carbolic, salicylic, or lactic acids. If death takes place, the mattress and coverlets and hangings should be burned. The room and adjacent rooms should be hermetically closed and sprayed for two hours with corrosive sublimate, 1 to 1000, and then kept open for two or three days before occupancy. Diarrhœa should be arrested at once with fifteen grains of subnitrate of bismuth and ten grains of benzo-naphthol three times daily. If this is insufficient, fifteen grains of salol before each meal, which should consist only of eggs and meat. If cholera is established, one drachm of lactic acid should be dissolved in a pint of sweetened water and a claret-glassful taken every two hours. For the vomiting, champagne by the dessertspoonful, or brandy by the teaspoonful every hour. Thirst is relieved by tea, coffee, or citric or hydrochloric acid lemonade (1 to 200 of sweetened water). Liquids should be given in small quantities frequently repeated. Opiates must not be prescribed. The patient must be kept warm by bottles of hot water. The room should be airy but free from draughts. If improvement does not follow, intra-venous injections should be made of chloride of sodium, 5; sulphate of sodium, 10; to distilled water 1000, heated to blood heat, and two quarts used. The transfusion frequently produces a veritable resurrection, and often this improvement is permanent.—*La Médecine Moderne*, 1892, No. 33, p. 517.

DRS. H. NOTHNAGEL and O. KOHLER caution against allowing any dyspepsia and especially any catarrhal conditions to go without remedy, and advise, as a prophylactic, eight to ten drops of hydrochloric acid in a quarter of a glass of boiled water after each meal. For the diarrhœa they recommend rest in bed, warm abdominal compresses, and tincture of opium with tea or rum, cognac or arrack. Bismuth subnitrate or salicylate, or alum, may be of use. For the vomiting, the carbonic acid waters—not alkaline—are useful. For the well-developed attack, high rectal irrigation with an ounce of tannic acid to the quart of boiled water. In the stage of asphyxia one or two quarts of sterilized water containing ninety grains of carbonate of soda and two drachms of chloride of soda, for subcutaneous injection into the abdominal wall. For the symptomatic treatment, champagne, strong wines, with the addition of ten to twenty drops of ether, or subcutaneous injection of one part of camphor in nine of oil of sweet almonds, warm baths, friction with alcoholic solutions; and for the cramps of the muscles, morphine hypodermati-

cally.—*Internationale klinische Rundschau*, 1892, No. 35, S. 1426, and *Wiener medicinische Presse*, 1892, No. 32, S. 1273.

DR. ECKSTEIN recommends the needle of Dürssen for massive hypodermatic injections of physiological saline solution in cholera. This needle has upon its proximal extremity an olive upon which a tube can be placed. The distal end is obliquely cut off, pointed, and has two additional openings on the side. The rubber tube is furnished with an intermediate glass tube, a bulb, and the end which is inserted into the receptacle for the injection fluid terminates in a glass tube of sufficient length to reach the bottom.—*Prager medicinische Wochenschrift*, 1892, No. 35, S. 407.

HAFFKINE'S METHOD OF PROTECTIVE INOCULATION AGAINST CHOLERA.

MR. E. H. HANKIN, having received in his own person the protective inoculation at the hands of M. Haffkine, gives an account of his experience. By cultivating the vibrio of cholera, first in diluted and then in undiluted rabbit's serum, it can be acclimatized so that it will be unharmed by the bactericidal action of this medium. Injections of a small quantity of a culture in rabbit's serum of these acclimatized vibrios into the veins of a rabbit results in death with the marked symptoms of cholera, and the post-mortem examination shows that the intestine is filled with "rice-water" secretion, which, as well as the mucous membrane of the intestine, contains the vibrios in large numbers. In some cases they have been found in the bile-duct and ureter, but never in other parts of the body. By passing the microbe through a series of guinea-pigs a *virus fixe* or *virus exallé* is obtained, generally between the twentieth and thirtieth passage. This *virus exallé* appears to be about twenty times as virulent as the ordinary form of the microbe. The attenuated virus is prepared by growing the microbe in a slow current of air. A flask of bouillon placed in an incubator is inoculated with microbes, which produce a culture and then rapidly die. It is therefore necessary to re-inoculate them every third day into a fresh flask, when it is found that after each passage they are more and more attenuated. Rabbits, then, are made immune by successive inoculations of attenuated and of the strengthened virus. In his personal experience the inoculation with attenuated virus caused the usual local œdema with some fever and malaise. Five days later the injection of *virus exallé* was made without marked symptoms save pain. In order to test the presence or absence of local immunity, five weeks after inoculation an injection of strengthened virus was made, which produced the same results as the attenuated virus did in the first instance. Of the questions that suggest themselves: whether immunity against one variety of cholera microbe will confer immunity against another, has been answered in the affirmative, so far as guinea-pigs are concerned; whether this treatment will confer permanent immunity can receive no definite answer, but it is more probable that an inoculation with *virus exallé* should confer lasting immunity than a slight attack of cholera. It is important to remember that very probably after the first inoculation, less probably after the second, there may be a temporary diminution in the power of resisting the entry of cholera microbes, so that inoculations should not be practised at a given place at the time that an epidemic is raging, without great caution. At present this method is not

attended by any grave disturbance of health, and it can be practised upon human beings with perfect safety. The fact that it produces immunity against cholera in any form in animals of such widely different organization as guinea-pigs and pigeons, gives reason for hoping that it may produce an equally good effect in human beings, but it must necessarily be a long time before we can possess any direct evidence of any value on this point.—*British Medical Journal*, 1892, No. 1654, p. 569.

FILTERED OR BOILED WATER?

M. A.-J. MARTIN, under this title, presents a very carefully studied paper. Recognizing the fact that many filters, so far from separating the bacteria, may even make the water richer in these organisms, this method cannot be recommended. Boiled water has lost its carbonic acid gas, and the salts of lime and magnesia are precipitated; the taste is flat, although on standing in a cool place it reabsorbs the greater portion of the lost gas. Even boiled water ought not to be long preserved. The problem apparently was solved in heating the water without loss of air, cooling it mechanically, and adding oxygen by means of an air-pump, or it can be boiled in closed bottles. Various ingenious apparatus has been devised for boiling water in closed vessels under pressure, and cooling it in the same apparatus. Investigations have shown that the slight differences observed in the chemical composition of the water before and after sterilization have not altered its potability. With a filter, one can drink only the water of which he knows the source; with boiling, one can use any water. Boiling, then, should be the procedure of choice as soon as any suspicion arises; it should be the rule, especially in large cities, during the progress of any epidemic.—*Gazette hebdomadaire de Médecine et de Chirurgie*, 1892, No. 37, p. 433.

THE DIGESTIVE FERMENT OF THE CARICA PAPAYA IN GASTRO-INTESTINAL DISORDERS.

DR. FRANK WOODBURY suggests the name "caricinum" or "caricin" for the papain of Finckler. Its physiological actions have been established to be upon albuminoids, hydrating them and converting them ultimately into peptones, converting with great promptness starch, the ultimate product being maltose, emulsifying fats, and possessing a direct tonic action upon the stomach, stimulating the secretion of gastric juice or pepsinogen, being also distinctly antiseptic, and given with true antiseptics, like salol, will not leave the digestive action checked. Even corrosive sublimate in dilute solutions does not interfere with its digestive powers. It acts at all temperatures, best in alkaline solution, but also in fluids with an acid or neutral reaction. It has no action upon living tissues and is positively innocuous when swallowed in any quantity that is likely to be administered. He summarizes its use as follows: 1. In actual or relative deficiency of gastric juice or its constituents. *a.* Diminished secretion of gastric juice as a whole: apepsia, anæmia and deficient blood-supply, wasting disease. *b.* Diminished proportion of pepsin: atonic dyspepsia, atrophy of gastric tubules. *c.* Diminution of hydrochloric acid: achlorhydria, carcinoma. *d.* Relative deficiency of gas-

tric juice: overfeeding. 2. In gastric catarrh. *a.* When there is tenacious mucus to be removed. *b.* When there is impaired digestion. 3. In excessive secretion of acid. To prevent duodenal dyspepsia. 4. In gastralgia, irritable stomach, nausea, or vomiting. 5. In intestinal disorders. *a.* In constipation due to indigestion. *b.* In diarrhœa, as a sedative. *c.* In intestinal worms [not verified by author]. 6. In infectious disorders of the intestinal tract. *a.* When there is abnormal fermentation. *b.* As a detergent in cleaning out the débris. 7. In infantile indigestion. The dose is one or two, possibly five grains, either alone or combined with bicarbonate of soda, extract of nux vomica, or both.—*New York Medical Journal*, 1892, No. 713, p. 115.

THE TREATMENT OF SEA-SICKNESS.

DR. W. W. VAN VALZAH believes in Rochet's theory, that the symptoms of sea-sickness are those of cerebral anæmia, as a result of deranged and diminished reflex muscular tonicity of which the loss of equilibrium is a sign. The treatment is directed to the digestive system, having one important object in view—to diminish the irritability of the sensory nerve-endings of the mucous lining of the alimentary canal by keeping the digestive tube functionally active and clean. This is accomplished by laxatives, limitation of sweets and starches, and the use of lean meats. During the first forty-eight hours on shipboard the patient is to rest in bed and sleep if possible, four light meals to be taken each day, and very little fluid drunk, a single cup of hot water with each meal. At the expiration of this period, the time, except that regularly given to sleep, should be spent in the open air, and the sensory vertigo supplanted by purposive movements as walking, and by mental occupation or diversion. An efficient treatment is that of bromide of sodium, which should be pushed to its physiological effects and its influence continued during the voyage. During the attack, if hyperæmia be present, the vertical position, a hot foot-bath, ice to the head or spine, possibly caffeine, antipyrine, or bromide of soda. If anæmia, atropine with nitro-glycerin, sometimes strychnine, and nitro-benzoate of caffeine, or ergotin may be useful. The horizontal position, whiskey (and food also) by the rectum, copious draughts of hot water, are advised. Frequently repeated and small doses of creasote, with lime-water and an infinitesimal quantity of ipecac, or oxalate of cerium in hourly five-grain doses, may be effectual in relieving vomiting. If these preventive precautions and remedies fail, the patient must content himself until he can again get into his element—the place where he was created and educated to live—on land.—*New York Medical Journal*, 1892, No. 715, p. 179.

BROMIDE OF STRONTIUM IN THE TREATMENT OF VOMITING.

DR. GIUSTO CORONEDI, on account of the deliquescence of this salt, prescribes it to be dispensed in glass tubes closed by a cork, each containing fifteen grains. He ascertained that the usual amount of free hydrochloric acid in the stomach does not set free bromine, but the remedy acts as a bromide. The daily dose employed in ten reported cases was sixty grains, or fifteen grains for a dose. It was more successfully employed in various gastralgias, nervous vomiting, that of pregnancy, of reflex irritations, when

it acts as other bromides, diminishing the excitability of the nervous centres, and of the nerve terminations in the stomach, and preventing reflex action, although containing a smaller percentage of bromine than either the sodium or potassium salt. Apparently more active than the other salts, it does not present the disadvantages of the potash salt; for example, the diminution of nervous and muscular energy after long-continued use.—*Lo Sperimentale*, 1892, fasc. 3, p. 222.

THE TREATMENT OF TYPHOID FEVER BY THALLIN.

DR. FRANZ SCHMID has treated twenty cases, with two deaths. The diet was milk, animal broths, with eggs and alcohol. At the outset calomel was administered, and as soon as the diagnosis was established the sulphate of thallin, in 1 or 2 per cent. aqueous solution, was administered every hour from six in the morning until nine at night, and in the night at two or three hour intervals. The initial dose was from one and one-half to three grains. This dose was increased every second or fourth hour by sixths of a grain until the temperature approached the normal or a little below it. This amount of the remedy was continued for from three to five days, then gradually diminished so long as the temperature remained about the normal. When it became subnormal the drug was omitted until it began to rise. The average duration of the use of this remedy was 16.8 days. Of the two fatal cases, in one the autopsy showed a fatty heart and very large spleen; in the other, a perforation near the ileo-cæcal valve. He concludes that: 1. Thallinization in typhoid fever is of equal value with hydro-therapeutic treatment, especially in severe cases and at the acme of the disease; 2. In the use of thallin it should be given in large doses, as above stated, increasing rapidly to an efficient dose, and avoiding variations in it.—*Correspondenz-blatt für Schweizer Aerzte*, 1892, No. 17, S. 529.

THE OCCASIONAL DANGER OF ANTIPYRETICS IN TYPHOID FEVER.

DR. J. H. MUSSER would hesitate to use any antipyretic during the first twenty-four hours after a patient is admitted to the hospital, for the rise of temperature is due to exhaustion, and this requires stimulants. Certain patients have idiosyncrasies which forbid the use of these remedies, no matter how high the temperature may be, if life be not threatened. In the later stages antipyretics are especially dangerous, and must be administered with the greatest care. He calls attention to cases of persistently high temperature, with abatement of all other symptoms, cases in which the morbid process has terminated, but on account of exhaustion, long continuance in bed on the limited diet, the use of an antipyretic would have been of no avail. These cases need stimulants, solid food, and getting the patient out of bed.—*Transactions of the College of Physicians of Philadelphia*, 1892.

A NEW METHOD OF TREATMENT OF FEVER.

DR. SOLTAU-FENWICK describes his ice-cradle, which he has used in connection with sponging off the patient with warm water, in a hundred cases of typhoid fever and in one hundred and fifty-three of acute inflammation of the

lungs. The skin is sponged with warm water, at about the temperature of 116° F., for ten minutes. The warm water was found to be pleasanter for the patient and frequently of greater antipyretic value. The fevers which do not respond to this treatment are frequently of unfavorable prognosis. The ice-cradle is an apparatus similar to that of the same name which is used in surgical wards for protecting the fractured limbs from the pressure of the bed-clothing, except that it extends the entire length of the body, and is sufficiently high to allow pails containing ice to be suspended from the hoops. Linen is placed over the bottom of the pails to prevent the condensed moisture from dripping upon the patient. Hot water containers can be placed at the feet if necessary. He concludes: 1. Temperatures of 103° F. can be reduced from one and a half to three degrees, and kept at that point. If the temperature is 105° F., or higher, cold baths or ice packs should be employed. 2. This remedy is extremely simple in its use, and entirely free from danger. 3. To obtain the highest degree of antipyretic effect, the greatest attention to details, and that a thorough draught through the apparatus be maintained.—*Berliner klinische Wochenschrift*, 1892, No. 31, S. 767.

SYPHILIS OF THE LINGUAL TONSIL.

DR. JAMES E. NEWCOMB reports a case in which the cure of this disease, which was characterized by nipple-shaped, grayish-red protuberances composed of groups of closed and inflamed follicles, with ulcerated summits and crowned with typical, clean-cut, mucous plaques, was complete in five weeks. Applications of the dilute acid nitrate of mercury, a sublimate gargle, and mixed treatment internally were employed.—*The Medical News*, 1892, No. 1016, p. 4.

ON BLISTERS AND BLOODLETTING IN PLEURISY AND PNEUMONIA.

M. P. DUROZIEZ presents much clinical evidence in favor of the retention of these methods in clinical work. In pneumonias, the age determines bloodletting; after forty-five years of age the results are very unfavorable, and in women the gravity of this disease is admitted. In pleurisy the fatal cases are fewer as the bloodletting becomes more frequent, although alcoholic individuals bear it badly. Blisters are of apparent usefulness in both of these diseases.—*L'Union Médicale*, 1892, No. 76, p. 3.

THE HYPODERMATIC INJECTION OF IODOFORMIZED GUAIACOL IN PULMONARY TUBERCULOSIS.

DRS. R. MASSALONGO and S. SILVESTRI believe that with a combination of these well-tried and approved remedies (1 part iodoform, 5 parts guaiacol, to 100 of sterilized oil of sweet almonds) injected into the scapulo-vertebral space, or, better, into the supra-spinous fossa, they obtained satisfactory results in eight reported cases. They conclude that it is especially indicated in the first, second, and rarely in the third stages; that the cough, expectoration, number of bacilli, fever, night-sweating, appetite, weight, and general appearance are improved; that these results are justified by the physiological properties, antiseptic, astringent, and modifying, of these drugs; that no

other pharmaceutical curative method has yielded so satisfactory results.—*Gazetta degli Ospitali*, 1892, No. 86, p. 802.

DYSPNŒA AND ITS TREATMENT BY DRUGS.

DR. W. TENNANT GAIRDNER classifies his cases as—1. Due to hæmatic causes, remedied by iron, arsenic, hygienic conditions, food, exercise, possibly by inhalations of oxygen. 2. Due to pulmonary causes, when expectorants are indicated, stimulating the “scavenger muscles” of the bronchial tubes, avoiding the use of opium. 3. Due to extra-pulmonary causes other than hæmatic, as cardiac, pleural, or pericardial effusions; dropsical swellings of all kinds; uræmic, when this origin must be carefully considered; and in general the maxim of Baglivi should be observed, to use diuretics, or in the failure of these, to employ drastic cathartics, or rarely venesection.—*Medical Press*, 1892, No. 2779, p. 131.

PROF. LEECH finds that the nitrites will relieve certain forms of dyspnœa, and his preference is for the nitrites of ethyl and soda and nitro-glycerin, as more effective and of more lasting influence than nitrite of amyl. A teaspoonful of a 3 per cent. solution of nitrite of ethyl is the most convenient form for administering a nitrite in dyspnœa. In case of failure with the nitrites he advises the vapor of ammonia.

DR. HANDFORD believes that the dyspnœa of migraine can be speedily relieved by saline aperients.

DR. OLIVER regards the use of morphine to be beneficial in some cases of bronchitis and of emphysema, accompanied by orthopnœa. In uræmic dyspnœa the nitrites were of very great service, but he would limit venesection to those cases in which dyspnœa was dependent upon, or associated with, dilatation of the right heart.

DR. WILBERFORCE SMITH advises in spasmodic paroxysms, belladonna, preferably a few drops given with little or no water, or administered by a spray-producer; in congestive cases, the cautious use of the hot-air bath; in the dyspnœa of anæmia (in girls), the prohibition of corsets.

MR. FREDERICK PEARSE, in acute spasmodic asthma, and in that associated with tumultuous action of the heart, recommends one or two five-minim doses of Fleming's tincture of aconite.—*British Medical Journal*, 1892, No. 1649, p. 295.

THE TREATMENT OF MYXŒDEMA WITH THYROID JUICE.

MR. G. R. MURRAY reports four cases treated by this method. The thyroid glands are removed from several sheep just before they are killed; each lobe is minced, bruised in a mortar, and allowed to stand for twelve hours in fifteen minims of glycerin and the same quantity of a one-half of 1 per cent. solution carbolic acid in boiled distilled water. It is then squeezed through a cloth in a press, which, as well as all other apparatus, has been cleansed by boiling water and a 5 per cent. carbolic acid solution. In the future it is proposed to use the liquefied carbonic acid apparatus of M. d'Arsonval. Twenty-five minims of this extract have been injected, with antiseptic precautions, beneath the skin of the inter-scapular region once a week. It may be advisable to give a smaller injection and repeat it more frequently in some cases.

The injection should be slowly administered, five minutes being required for the process; stopping the process if the patient begins to flush, suffers from nausea, or has stabbing pain in the lumbar region. No pressure should be made over the seat of the injection. These cases show that thyroid extract can, to a very considerable extent, supply the place of the natural secretion which is lost in myxœdema. The patient's condition can be much improved, and this improvement can be maintained so long as the treatment is continued. The unpleasant symptoms can be obviated by more slowly injecting the fluid, and the danger of abscesses avoided by strict asepsis. The cases with signs of cardiac degeneration should either not be selected for treatment, or they must be specially warned not to take any unusual exercise when the improvement takes place.—*British Medical Journal*, 1892, No. 1652, p. 449.

A CASE OF EPILEPSY CURED BY INJECTION OF PASTEUR'S ANTIRABIC LIQUID.

DR. GIOVANNI ACHILLE reports a carefully observed case of a man who for three years has suffered from *grand mal* and consequent mental symptoms, so that it was necessary to place him in the hospital. The treatment lasted ten days, and ended the attacks, which came on several times daily, with intervals of freedom for a few days. The cessation of the disease was accompanied by great improvement in his mental condition.—*Gazetta degli Ospitali*, 1892, No. 87, p. 811.

THE TREATMENT OF DELIRIUM TREMENS.

DR. NORMAN KERR believes that this condition is the effect of alcoholic poisoning, and due to the cumulative specific action of the poison on the cerebral tissue through the alcoholization of the blood. Therefore this poison should be eliminated by liquor ammonii acetatis in drachm doses every hour, avoiding all narcotics and the administration of alcoholic liquors. Milk, beef-juce, broth, and coffee should be frequently given. In this way we give the *vis medicatrix* "a fair field and no favor."—*Medical Press*, 1892, No. 2779, p. 135.

THE USE OF VEGETABLE ALBUMIN IN THE DIETETIC TREATMENT OF DIABETES MELLITUS.

DR. WILHELM EBSTEIN recommends aleuronat, a dry, yellow powder, almost without any taste or odor, which consists chiefly of vegetable albumin, made by the secret process of Hundhausen. This powder can be used for the same purposes as is flour by the non-diabetic person. Bread can be made containing at least one-half of this substance. The danger of a pure or entire albumin food, as shown by the appearance of acetone or aceto-acetic acid in the urine, must be recognized. Light cases of this disease should have this diet more strictly enforced; but in the more serious forms, especially those accustomed to a poor food, lacking in albumin, he employs a nutrition which is richer in albumin, quite gradually. In place of sugar, he uses levulose, chemically pure and especially free from dextrose, which may, in the course of time, supplant the often disagreeable saccharine. Taking a

considerable amount of fat may limit also the necessity for a larger quantity of carbohydrates.—*Medical Chronicle*, 1892, No. 6, p. 361.

MERCURY SOZOIODOL.

DR. K. WITTHAUER has made use of this preparation, which contains 31 per cent. of mercury and 38 per cent. of iodine, in the form of ointment, dusting-powder, and in emulsion. As an ointment he employs a 1 per cent. solution in 90 parts of lanolin and 10 of olive oil, spread upon strips of linen, closely applied to the ulceration, and changed as often as the discharge comes through the dressing. As a powder, it is diluted with 99 parts of talc. In tubercular fistulas or other inaccessible ulcerations, he employs a 1 per cent. emulsion in 8 parts of glycerin, 4 parts of gum arabic, and 88 parts of distilled water. This is injected every three or four days to the amount of 15 to 30 drops, into the fistulas, and the openings covered with gauze, drainage being used when necessary. In using the emulsion as an injection into closed fungous joints, it gives rise to less pain than iodoform, and only a slight fever or none at all. Double the quantity above can be used.—*Münchener medizinische Wochenschrift*, 1892, No. 34, S. 602.

DERMATOL.

DR. ARTHUR K. STONE reports that he has had very satisfactory results. Subgallate of bismuth is a saffron-yellow powder, insoluble in water, alcohol, or ether, odorless, non-hydrosopic, astringent, non-poisonous, non-irritating, stable, unaffected by steam or dry heat in the process of sterilization. His laboratory experiments showed that in addition to its mechanical power of repelling water, and thus producing a food famine and consequent death of many of the bacteria, it has active powers in hindering bacterial growth, although it does not have bactericidal action. The method by which this hindrance is accomplished is probably due to its chemical combination with the ptomaines produced by the growth of the bacteria, forming compounds hostile to their rapid development. In abscesses, when the cavity was thoroughly curetted and cleaned out, healing was favorably influenced. Superficial excoriations and burns, chronic moist eczematous ulcers of the leg, and irritations of the skin were advantageously treated. It is not apparently useful for the purpose of starting granulation when the wound has become sluggish; indeed, it is likely to increase this condition.—*Transactions of the Massachusetts Medical Society*, 1892.

THE DANGER OF ADMINISTERING CHLOROFORM IN THE PRESENCE OF A NAKED FLAME.

MR. CHARLES MARTIN has remarked frequently, when chloroform was administered, a dry, irritating, spasmodic cough, gradually becoming more severe; smarting of the eyes; a pungent odor, somewhat resembling that of chloride of lime, and accompanied by a stinging sensation in the nostrils, and a sense of oppression in the chest amounting to actual distress; not infrequently changes in the patient's condition which cause great anxiety; sometimes synchronous weakening of the cardiac and respiratory mechanisms;

at other times embarrassed and stridulous respiration, cyanosis, and weakened pulse: these symptoms necessitating the use of ammonia, nitrite of amyl, or artificial respiration. It is believed that two molecules of chloroform combine in the presence of a flame with one molecule of carbonic anhydride and one of oxygen to produce three molecules of carbonyl chloride and one of water. The former, being unstable, is decomposed into hydrochloric acid and carbonic anhydride. In this hydrochloric acid lies the explanation of the symptoms and of the fact that ammonia is of great value as a restorative. The conclusion is that the operating-room should be heated by hot-water pipes, lighted by electricity, and should be large and well ventilated.—*Birmingham Medical Review*, 1892, No. 168, p. 83.

THE RESPONSIBILITY OF PHYSICIANS IN THE USE OF CHLOROFORM AND OTHER INHALED ANÆSTHETICS.

DR. PASSET formulates the rules for administration which should be carefully observed: 1. Before each narcosis there should be made a careful examination of the patient, and especially of the organs of circulation and respiration. 2. Chloroform should be only administered when well mixed with air. 3. The anæsthetic should be stopped with the advent of tolerance or at the disturbance of respiration or circulation. 4. The circulation and respiration should be continually watched, and at any disturbance of these functions the appropriate remedies should be used with discretion and energy; when death is imminent the artificial respiration and other methods of resuscitation should not be stopped too soon. 5. Both chloroform and ether narcosis are avoided during stomach-digestion, and tight clothing and false teeth are removed before it is begun. 6. No anæsthetic should be used which one knows, or which (after examination) one can know, to be impure. Whatever happens when all these rules have been carefully followed should not be laid to the physician, for *ultra posse nemo tenetur*.—*Münchener medicinische Wochenschrift*, 1882, No. 32, S. 567.

TROPA-COCAINE AS A LOCAL ANÆSTHETIC.

DR. ARTHUR P. CHADBOURNE prefers this term instead of tropin to indicate a new coca-base, and this is suggestive of the relationship which exists between it and the alkaloids atropine and cocaine. Giesel isolated a new alkaloid from the leaves of a small-leaved coca plant of Java, which was proved by Liebermann to be benzoyl-pseudo-tropeïn, who succeeded in separating the pseudo-tropeïn, and then from it made benzoyl-pseudo-tropeïn synthetically. This pseudo-tropeïn is considered as chemically identical with that from the *Hyoscyamus niger*. This benzoyl-pseudo-tropeïn, which the author, deserving the gratitude of the profession, has named tropa-cocaine, is a powerful local anæsthetic, resembling, but not identical in local action with cocaine. In the eye it does not cause the ischæmia of the true anæsthetics (cocaine) nor the marked irritation and hyperæmia of the group of substances called by Liebreich *anæsthetica dolorosa*; but it is physiologically the connecting-link between them. The synthetical hydrochlorate of the base, if dissolved in physiological salt solution, seldom causes even a tem-

porary smarting, or hyperæmia. As the alkaloid is almost insoluble, the hydrochlorate is used. His conclusions are that it causes complete local anæsthesia of the skin more quickly than cocaine; that this anæsthesia lasts longer than that of cocaine; that the extent is possibly greater; that a one-half of 1 per cent. tropa-cocaine solution causes in most cases marked diminution in cutaneous reflex near the point of injection. In a rabbit's eye it acts more quickly, and probably in weaker solution, and less constantly causes mydriasis than cocaine. He summarizes his results as follows:

1. Tropa-cocaine is less than one-half as toxic as cocaine.
2. The depressing action, both on the cardiac motor ganglia and the heart muscle, especially the latter, is much greater with cocaine.
3. Local anæsthesia, both of the eye and skin, is much more quickly complete with tropa-cocaine, and is possibly of longer duration.
4. Slight hyperæmia is occasionally present, but quickly disappears, whilst with cocaine only ischæmia is seen.
5. Mydriasis is usually absent, but always seems to be less than after cocaine.
6. Solutions of tropa-cocaine are moderately antiseptic, and retain their strength for at least two or three months. Cocaine solutions often begin to lose their activity when only three or four days old.

PROF. SCHWEIGGER found in clinical work that in the human eye the above conclusions were correct, save that the anæsthesia did not last so long as under cocaine.—*British Medical Journal*, 1892, No. 1651, p. 402.

TOXICOLOGY OF MALE FERN WITH SPECIAL REFERENCE TO VISUAL DISTURBANCE.

DRS. K. KATAYAMA and I. OKAMOTO have studied the reported cases of poisoning, more than twenty in number, which have occurred since 1881, and find that ten of these presented notable visual disturbances, five of these having occurred in Japan. Coincident with the increasing frequency of these cases has been the gradual raising of dosage, it being the general opinion of physicians that it was a harmless as well as an efficacious drug. From experiments, they conclude that it acts particularly upon the digestive system and nerve centres; that failure of vision occurs chiefly in persons in poor health (*cf.* alcohol or tobacco amaurosis). Practitioners should note: 1. That extract of male fern is better to be prescribed in small doses. 2. Being readily absorbed when mixed with oil, and even without oil, when it remains long in the alimentary canal, it must be followed by a cathartic other than castor oil. 3. Such symptoms as headache, amblyopia, should be watched for, and with their appearance the further use of the medicine stopped.—*Sei-i-Kwai Medical Journal*, 1892, No. 6, p. 101; No. 7, p. 121.

The following papers are worthy of notice:

"On the Study of Indigenous Drugs" [of India], by SURGEON B. D. BASU, *Indian Medical Gazette*, 1892, No. 8, p. 225. A brief historical sketch based upon the study of the Rig-Veda, works of Charaka and Sashruta, Raja Nighantu, Madana Pâla Nighantu, Bkâva Prâkasha, and the writings of the European period of Indian history.

"The Treatment of Diabetes Mellitus," by DR. LENNÉ, *Münchener medi-*

cinische Wochenschrift, 1892, No. 34, S. 601. Recommends alkaline waters as far superior to all drugs.

"The Seventh Case of Traumatic Tetanus Cured by the Antitoxin of Tizzoni-Cattani," by DR. GIOVANNI CASALI, *Centralblatt für Bakteriologie und Parasitenkunde*, 1892, Nos. 2, 3, S. 56.

"A Case of Tetanus Successfully Treated with Tizzoni's Antitoxin," by DR. E. FINOTTI, *Wiener klinische Wochenschrift*, 1892, No. 30, S. 431. The reports of the use of the Tizzoni-Cattani antitoxin are becoming more and more frequent, and bear out the promise of success offered by the earlier cases.

"The Effect of the Quinines upon the Malarial Parasites and their Corresponding Febrile Attacks," by PROF. CAMILLO GOLGI, *Deutsche medicinische Wochenschrift*, 1892, No. 29, S. 663, and No. 30, S. 685. A valuable paper, exhaustive and practical.

MEDICINE.

UNDER THE CHARGE OF

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THE CHOLERA IN HAMBURG.

EUGENE FRAENKEL (*Deutsche medicin. Wochenschr.*, No. 36, p. 818) briefly relates the history of the recent epidemic of cholera in Hamburg. He denies the statement so generally made that there was any attempt at any time to suppress the facts or to conceal the true nature of the disease after it was recognized. Between the 17th and the 20th of August there occurred several fatal cases that presented symptoms suggestive of cholera. The first of these, examined on the 17th, proved, post-mortem, not to be a case of true cholera. On the 21st, five cases resembling this were admitted to the old Krankenhaus. Four of these terminated fatally. These facts were at once reported by the house physician to the proper authorities, and on the 22d were supplemented with the information that microscopic examination of the dejecta of these patients disclosed the presence of comma bacilli. On the same date a post-mortem examination was made in the case of a patient who had died in the new Krankenhaus with symptoms of cholera, in which an examination of the intestinal contents disclosed the presence of large numbers of comma bacilli. The case was reported to the health board. On the same date the diagnosis

of cholera was also made in a case that had died on the 19th, in which the cultures had just developed. Koch was now called in consultation, and confirmed the accuracy of the observations that had been made. Special provision was at once made to meet the requirements of the emergency. Accommodations were made for 2000 patients, and a service of 150 persons and 60 two-horse ambulances was organized for the transportation of patients. Between August 20th and 29th, 3403 calls were responded to, involving 2335 patients and 1068 dead bodies. The mortality in the hospitals was enormous; although the work was kept up night and day, it became impossible to dispose of all the cases on the same day as death took place, so that for a time the number of bodies in the deadhouse ranged from 100 to 130. It is not known how the disease was introduced, whether by land or by sea; but emphasis is laid upon the fact that there had not been a case that could have been considered as even suspicious among the large number of Russian emigrants that had passed through the city. The first victims lived in the southwestern part of the city, but the whole city soon became infected. The cases were almost exclusively among the laboring classes. Cases and deaths among the better class were only exceptional. The rapidity of the spread is not yet accounted for, although the possibility of transmission by the water-supply at once suggests itself. [Koch is credited with the statement that the river Elbe was probably the source of infection.] The extreme heat that at the time happened to exist increased the liability to acute disorders of the gastrointestinal tract.

The foudroyance of the spread of the disease over the whole city, and the rapidity of increase in the number of cases to enormous figures seemed peculiar to the epidemic. The number of cases terminating fatally within a few hours of the onset of the attack, without the appearance of pronounced typical symptoms, was especially large. Persons were attacked at their work, many while on boats, and although as rapidly as possible sent for, were brought moribund into the hospital. In all of the 125 cases in which up to the time of the report post-mortem examinations had been made, all the statements made by Koch were fully verified. All of the methods of treatment proposed, from salol to subcutaneous injections of water and Cantani's enteroclysis, utterly failed.

The following figures (*Deutsche medicin. Wochenschr.*, 1892, No. 37, p. 839) are announced as authentic, being based upon the statement of the medical inspector as revised by the statistical bureau of the city of Hamburg:

	Cases.	Deaths.		Cases.	Deaths.
Up to August 20,	86	36	September 1,	843	394
August 21,	83	22	" 2,	809	478
" 22,	200	70	" 3,	777	437
" 23,	272	111	" 4,	679	293
" 24,	367	114	" 5,	582	281
" 25,	673	192	" 6,	485	258
" 26,	991	315	" 7,	419	224
" 27,	1101	456	" 8,	346	160
" 28,	1036	428	" 9,	350	150
" 29,	982	394	" 10,	213	113
" 30,	1086	484			
" 31,	858	395		13,238	5805

A CASE OF RAPIDLY FATAL LEUKÆMIA AFTER TRAUMATISM.

GREIWE (*Berliner klin. Wochenschr.*, 1892, No. 33, p. 825) has reported the case of a locksmith, twenty-eight years old, previously in apparently perfect health, who complained of severe pain in the left hypochondrium after having lifted an unusually heavy weight. A day later hemorrhage from the mouth took place, and this was repeated on the following day. There had been no cough; the appetite had been preserved; the patient had lived amid favorable conditions, and had always had a sufficiency of good food. He was intensely anæmic, and presented numerous subcutaneous extravasations of blood, which he had observed but had ascribed to injuries received in his work. There was continuous bleeding from the gums. The case was thought to be one of scorbutus. An examination of the blood, however, revealed the existence of lymphatic leukæmia, large lymphocytes predominating. Further examination now showed that the cervical, brachial, inguinal, and axillary lymphatic glands were slightly enlarged and sensitive to pressure. The spleen and liver were also found to be enlarged. Hemorrhage from the nose and mouth was repeated; new subcutaneous extravasations occurred, and the patient died of asthenia on the tenth day after the injury. The findings at the autopsy confirmed the diagnosis of leukæmia. From a careful study of the case the conclusion is reached that the trauma did not act as the cause of the disease, but only served to call into activity a previously latent condition.

THE PATHOLOGY OF ARRESTED CEREBRAL DEVELOPMENT.

SACHS (*Journal of Nervous and Mental Diseases*, 1892, No 8, p. 603) has reported the case of an infant, born at term, of normal physical development; another child in the same family had presented similar symptoms, dying when twenty-four months old; although two healthy children were born in the interval. The infant was said to have thrived until it was eight months old. When seen at the age of thirteen months, its head drooped and it was unable to sit up without support; there was no perception of light; the pupillary light reflex was wanting; there was slight sense of hearing. The upper and lower extremities were somewhat spastic, while spontaneous movements were absent. The knee-jerks and the plantar reflexes were exaggerated; ankle clonus was not obtainable. The child continued to grow worse. Sight and hearing became completely lost; the mind was entirely blank. The child died at the age of twenty months, extremely marantic. A week before death there had been considerable fever and several convulsive seizures. At the autopsy the dura was found adherent to the calvarium. The brain was firm to touch. The pia detached readily. Neither brain nor cord presented macroscopic change. After hardening in Müller's fluid sections were stained. Few and unimportant changes were found in the ganglia, pons, medulla, and cord. In the cortex of the cerebrum, however, not a single normal pyramidal cell could be found; in all the layers the bodies of the cells were altered in shape or in general appearance; the nuclei and nucleoli were distinct but surrounded by an altered protoplasm that failed to take the stain properly. The bloodvessels were present in at least usual number, most of them being filled with blood; but there was no evidence of an active inflammatory condition. The white

fibres entering the cortex presented no deviation from the normal. Sachs considers the condition an arrest of cortical development—a true agenesis corticalis.

THE MICROÖRGANISM OF TYPHUS FEVER—MICROCOCCLUS EXANTHEMATICUS.

LEWASCHEW (*Deutsche medicin. Wochenschr.*, 1892, No. 13, p. 279; No. 34, p. 766) records having detected in the blood of a considerable number of persons suffering with typhus fever and having cultivated from blood removed from the spleen and from the finger a distinctive microörganism. Cultivation upon the usual media proved unsuccessful. By the employment of a 1 per cent. or a 1½ per cent. serum-agar made with ascites fluid, it was possible to reproduce the organism. At a temperature of 96.8° to 98.6° F., a characteristic growth developed in from twenty-four to forty-eight hours. No growth took place, however, at ordinary room-temperature, although the capability of subsequent development under proper conditions was preserved, even after the lapse of a considerable time. A small quantity of such a culture, viewed in a drop of bouillon or of physiologic saline solution, is seen to contain myriads of cocci having diameters varying from 0.2 to 0.5 μ . The organisms usually appear single, seldom in pairs, and rarely in small chains. Some are not in motion, while others are in active movement. In conformity with this observation, it is possible to detect a long tenuous process in connection with many of the cocci, even without special preparation, but more distinctly after staining by the method of Loeffler. Under high powers of the microscope, corresponding organisms were found in the blood obtained from the spleen and the tip of the finger. The cilia cannot be brought out by staining with the ordinary aniline colors, but they become apparent after treatment with 2 or 3 per cent. solutions of osmic acid. Involution-forms present apparent excrescences. The organisms were found at all stages of the disease.

ARTIFICIAL IMMUNITY TO CHOLERA.

G. KLEMPERER (*Berliner klin. Wochenschr.*, 1892, No. 32, p. 789) has succeeded in protecting guinea-pigs and rabbits from Asiatic cholera by previous treatment with modified cultures of the comma bacillus. Thus, guinea-pigs that had been treated with cultures heated for three days at a temperature of 104.9° F., and others treated with cultures kept for two hours at a temperature of 158° F., proved immune to inoculation with cultures that proved fatal to untreated animals. Rabbits were rendered immune by intravenous injections of cultures heated for two hours at a temperature of 158° F., while inoculation with the serum of protected rabbits conferred immunity upon guinea-pigs. It was also possible to confer immunity upon guinea-pigs by the administration by the mouth of the modified cultures.

PRIMARY ERYSIPELAS OF THE LARYNX.

SAMTER (*Deutsche medicin. Wochenschr.*, 1892, No. 34, p. 769) has reported the case of a painter's assistant, thirty-seven years old, who had been suddenly seized in the night with a chill, soon followed by difficulty in

swallowing. Next morning the mucous covering of the epiglottis was swollen and reddened and the submucous tissues infiltrated. The temperature rose to 102.2° F. In the course of the day the inflammation extended to the other structures at the entrance to the larynx. During the night intense dyspnoea suddenly set in, so that tracheotomy was performed. For the subsequent two weeks the temperature ranged between 100.7° and 101.6° F. in the morning, and between 102.2° and 103.4° F. in the evening; the inflammatory process extending down the larynx and finding its way out of the opening in the trachea. Cover-glass preparations made from fluid obtained by means of a hypodermatic syringe from beneath the swollen membrane covering the epiglottis disclosed the presence of streptococci and staphylococci. The erysipelatous process progressively invaded the neck, the trunk, and the face. The tracheal canula was removed after six days. In the second week abscesses formed in the left inguinal fold, in the left supra-scapular fossa, and over the ensiform cartilage, the pus from which contained the streptococcus of erysipelas and the staphylococcus pyogenes citreus.

HEPATIC CIRRHOSIS IN CHILDREN.

DR. STUART TIDEX (Montreux, Switzerland) records a case of cirrhosis of the liver, in a tall, thin boy of eleven years. One brother had died with what was described as leucocythæmia; otherwise the family history was good, and there was no history of alcohol. The illness ran a very rapid course. About the middle of March he had epistaxis, vomiting, and shivering fits.

On the 23d the urine contained albumin and bile, and on evaporation deposited concentrically marked spherules and fagot-shaped bundles of crystals, presumably leucin and tyrosin, though the fagots were not typical. He had emaciated greatly since three months. There was no fever, nor œdema of extremities, nor ascites, but slight general icterus. On the 30th, enlargement of the liver was made out.

On April 5th, ascites was first detected and steadily increased until death (from toxæmia) on April 9th.

The necropsy revealed a typical hobnailed liver, and microscopical examination a typical polylobular cirrhosis. The mesenteric glands and those in the portal fissure were enlarged, but not caseous or suppurating. The portal vein was compressed by enlarged glands in the portal fissure.—*British Medical Journal*, 1892, No. 1646.

INSANITY CAUSED BY INHALATION OF SULPHURETTED HYDROGEN.

DR. J. WIGGLESWORTH (Rainhill Asylum) records two cases of acute mania due to the above cause. In one case, however, the nature of the gas inhaled is not quite certain, but it was, in all probability, sulphuretted hydrogen.

Laborers in chemical works are quite familiar with H₂S and its usual effects on the system. It is not at all uncommon for persons exposed to its fumes to become "gassed," as the saying is—that is, they pass into a condition of insensibility which lasts a variable time, and when coming round they are often very sick and dazed, and have a sense of oppression about the chest, and there is often a good deal of prostration for a day or two afterward. Rarely the insensibility ends in death. It is, however, very unusual for lasting or

permanent effects to be produced on the nervous system, such as come under the designation of insanity. Cases have been recorded by Savage and others in which insanity—generally taking the form of mania—has resulted from the inhalation of chloroform, ether, nitrous oxide gas, and other similar agents, and the cases above mentioned seem quite to fall in line with these. One of Wigglesworth's patients recovered completely after five months' treatment in the asylum, but the other, although he grew more tractable at the end of one year, will probably never fully recover.

"The effect of all these agents appears to be to paralyze, in the first instance, the highest controlling and coördinating plexuses in the brain. If the dose be large or the administration continued, more and more of the cortical centres in a descending series are involved, and insensibility ensues. But when the paralysis is confined to the highest cortical arrangements, the immediate result is not lethargy, but excitement, owing to the centres next in series being emancipated from the control of the higher, and hence acting over-vehemently and incoherently. Such, at least, is the explanation which I have to offer of the pathology of these toxic cases, which are hence assimilated to the more ordinary forms of mania which we meet with in practice."—*British Medical Journal*, 1892, No. 1646.

A SUCCESSFUL TRANSFORMATION OF SMALLPOX INTO COWPOX.

Under this title DR. T. WHITESIDE HIME (Bradford) describes a series of experiments conducted by himself in the presence of independent observers.

Variolous lymph was obtained from a woman suffering from semi-confluent smallpox, of which she eventually died. With this a bull calf (calf No. 1) was inoculated next day on the left side along fourteen incisions.

On the eighth day some lymph was collected from the pocks which had developed.

With this Dr. Hime inoculated his own arm. The insertion produced a slight local effect, and a scab which fell off on the eleventh day, leaving a glazed, speckled surface which seemed to be minutely foveated. There were no general symptoms.

At the same time another calf (calf No. 2) was inoculated with the material collected from calf No. 1, as was also Dr. W. D., who had not been revaccinated since infancy (thirty-two years). The inoculation gave rise to the symptoms of a primary vaccination, and resulted in the formation of two true vaccine pocks.

Calf No. 1 was now inoculated with fresh fourth-day calf vaccine by thirteen insertions. There were no symptoms, and every insertion failed.

"The calf had been rendered refractory to vaccine by variolation."

With regard to calf No. 2, inoculated direct from calf No. 1, every one of the twenty-nine insertions made took.

Lymph from this calf was sent to several persons, and used with perfect success.

A child of four months was vaccinated with it and developed typical vaccinal pocks. A revaccination with other lymph made a month after to test the efficacy of the first inoculation failed entirely.

"Two points alone remain to be noticed. One of the ablest of those who

refuse to believe that variolation of the calf produces cowpox (Bouley, *Pathologie Comparée*) alleges among other proofs of his opinion (1) that the eruption produced by variolation of bovines dies out through successive inoculations of animals of that species; (2) that the virus taken from a variolated bovine and inoculated in the child, and from the child returned to a bovine, never produces an eruption of cowpox.

"At present I have in my place calf 4, inoculated in direct succession from calf 1, and the eruption is to-day perfect and typical and active, and shows no signs of dying, but the opposite. And as to the second point, I have also a calf at present which has six fine pocks produced by six insertions of lymph taken from the child, T. A., referred to above. Both the criteria laid down by Bouley, therefore, have no existence. But he is referring especially to the adult ox—which he probably never did variolate—I to the calf, which I and others have successfully variolated."—*British Medical Journal*, 1892, No. 1646.

MADURA FOOT OF INDIA.

In the course of a short article on the above disease, DR. N. F. SURVEYOR (London) sums up the chief differences between Madura foot and actinomycosis as follows: *a.* Madura foot is invariably a chronic disease. *b.* The internal organs are never affected, as far as our present knowledge goes. *c.* The constitutional symptoms are always very slight. *d.* Actinomycosis hominis is almost unknown, or very rare, in India. *e.* The sulphur-colored bodies of actinomycosis hominis have never been discovered in Madura foot. *f.* The peculiar homogeneous reniform bodies with the clubs and filaments look at least like some ray-fungus.—*British Medical Journal*, No. 1654. Cf. THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1892, No. 245, p. 344.

SPONTANEOUS RUPTURE OF THE SPLEEN IN AGUE.

JOHN BOWIE, M.B. (Blantyre, East Central Africa), reports the following case: The patient was a tall, strongly-built cavalry soldier. His personal history was good. He was first seen by Bowie during a mild attack of ague, having experienced two slight attacks a fortnight and a month previously. There were no unusual symptoms, but the patient was exceedingly anxious about himself. On the following evening he had another rigor, with nausea and vomiting. Before the hot stage he complained of severe pain at the heart and passed a very bad night, retching continuously. In addition to this there was pain in the region of the kidneys, with great desire, but inability, to pass urine. When seen next morning the patient had an anxious and frightened look. The face was a dirty-gray color and slightly pinched. The eyes were bright, the pupils dilated. There was intense thirst. The surface was cold. He complained of pain below the ribs on both sides, increased by movement or attempts to breathe deeply. The heart-sounds were faint and indistinct, and the radial pulse could not be counted. The abdomen was not tumid. The walls were tense above, but flaccid below the level of the umbilicus. An ounce of turbid albuminous urine was withdrawn by catheter. The retching and pain were temporarily relieved by champagne and morphine, but

in the course of a few hours the lividity of the lips gave place to marked pallor. The thirst continued intense, and a few hours later intense dyspnoea and a short general tonic convulsion closed the scene.

Necropsy, three hours after death. Rigor mortis was well marked in the neck, arms, and hands, beginning in the legs. On opening the abdomen there was a gush of about a pint and a half of dark fluid blood; on gently retracting the walls without disturbing the relation of parts, a thick black clot of blood about as large as a cocoanut was seen lying below and to the left of the distended stomach; from this large thick clot there passed a long clot about an inch and a half broad by half an inch thick across the abdomen to the right, ending at the portal fissure of the liver; extending downward from the large clot was a second thin large clot which passed down the left side into the pelvis. The limitation of the clots was very distinct, none being found in any other situation. On removing the large clot it was found to be in connection with a rent about four inches in length on the anterior external surface of the spleen. On removing the spleen very carefully (there were no adhesions) and examining it, the capsule was found to be clearly separated from the parenchyma for a distance of about two inches on either side of the rent. On grasping the edges of the torn capsule and holding up the organ, it had exactly the appearance of a miniature placenta and membrane, the separated capsule forming a shallow membranous bag, at the foot of which, lying flattened out, was the splenic parenchyma. The parenchyma was neither soft nor diffuent, but rather firmer than normal and of a lighter color (probably due to compression by the blood effused between the capsule and the parenchyma). The capsule was tolerably tough and could not be readily torn. On cleaning away all the blood-clot and blood from the spleen the organ seemed little, if at all, larger than a normal one. The other viscera were practically healthy.

The special interest in this case seems to be the really healthy condition of the patient previously to the fatal rupture. Spontaneous rupture of the spleen is by no means a unique accident, but in almost all the cases in which it has been noted it has occurred either during or following some serious and more or less prolonged blood disease.—*Lancet*, 1892, No. 3603.

A RAPIDLY FATAL CASE OF CHOLERA MORBUS.

FÜRBRINGER (*Deutsche medicin. Wochenschr.*, 1892, No. 34, p. 768) has reported the case of a woman, fifty-two years old, previously healthy and well nourished, who, while at work and without recognizable cause, was suddenly seized with cramps in the calves of the legs, griping, nausea, and diarrhoea. The stools were thin and profuse, the later evacuations being colorless and odorless and containing shreds. Symptoms of collapse soon set in, with cold sweats, sunken eyes, drawing up of the legs, loss of voice, feebleness of heart, depression of temperature, dyspnoea, muscular twitching, and sopor. The bladder contained no urine. The patient failed to respond to stimulants, although the diarrhoea and vomiting ceased. A portion of the intestinal contents was removed from the rectum by aspiration for bacteriologic examination. Despite energetic treatment, the woman died, thirty-three hours after the onset of the attack, the temperature shortly before death

sinking to 95°. At the autopsy, rigor mortis was marked and there was considerable lividity of the surface. The lungs on section presented hemorrhagic areas. The epicardium was likewise the seat of small hemorrhages. The serous covering of the abdominal viscera was greatly injected. The mucous membrane of the jejunum was covered by a flocculent, yellowish, pasty material, and contained numerous small ecchymoses. The contents were liquid, turbid, and yellowish, without special mixture of mucus. The appearance of the ileum closely resembled that of the jejunum, except that the solitary follicles were considerably swollen. Peyer's patches were swollen in smaller number. The whole of the large intestine contained a large amount of yellowish liquid. The mucous membrane and the follicles presented changes corresponding with those in the small bowel. The spleen was somewhat enlarged, its capsule was wrinkled. The liver was of moderate size. The kidneys were rather small. The urinary bladder was empty. The mucous membrane of the vagina was the seat of a few ecchymoses. The uterus contained a readily detached clot of blood at the orifice of the left tube. The brain was œdematous. The intestinal contents, examined microscopically, were found to contain, among other matters, curved and S-shaped bacilli, closely resembling cholera bacilli. It was possible to cultivate from the intestinal contents a spirillum closely resembling the cholera bacillus and to obtain a striking cholera-red reaction. The specific bacilli were, however, not present; nor was the bacillus described by Finkler and Prior in the stools in cases of cholera morbus present.

TUMOR OF THE PINEAL GLAND.

ZENNER (*Alienist and Neurologist*, 1892, vol. xiii., No. 3, p. 470) has reported the case of a boy, thirteen years old, who for eight months had constant headache, with remissions and exacerbations and not infrequently attended with vomiting. Soon after the headache was first complained of, the gait became staggering and the head somewhat retracted and deflected to the left. Vision became impaired until blindness existed. Hearing likewise became progressively imperfect. Speech grew indistinct and unintelligible. For four months there had been repeated several times daily paroxysms lasting, as a rule, for a few minutes, but occasionally longer, in which the patient lost consciousness and became rigid. The mental condition deteriorated and the sphincters became incontinent. Contractures developed in the left upper extremity. Transient difficulty of swallowing appeared. The child became greatly emaciated. There was, however, no evidence of motor palsy. Sensation appeared to be unimpaired. The pupils were large, but failed to respond to light. There was bilateral optic neuritis. The reflexes were tested with difficulty. The cremasteric reflexes were present. The knee-jerk was on one occasion elicited upon the right, but on another occasion it could not be brought out on either side. On the day of death several tetanic spasms occurred. At the post-mortem examination the skull-cap was found to be unusually thin; the dura was tense, the convolutions being flattened and compressed. Free within the cavity of the ventricles, which were greatly distended by a large accumulation of fluid, was a soft, oval tumor, as large as a walnut, with slight connective-tissue attachment to the endypma

of the ventricles. The growth contained considerable brain sand, and on microscopic examination proved to be a glio-sarcoma.

SYPHILIS AND HYPERTROPHIC OSTEO-ARTHROPATHY.

SCHMIDT (*Münchener medicin. Wochenschr.*, 1892, No. 36, p. 633) has reported the case of a woman, forty-eight years old, who complained of pains in the arms and legs, and presented bulbous enlargement of the terminal phalanges of the fingers of both hands, swelling and induration at the wrist-joint, and œdema about the elbow-joint; the extremities of the toes presented similar changes, but no other portion of the skeleton appeared to be affected. The woman had borne two illegitimate children, one of which had died with atresia ani and the other of smallpox. The patient subsequently had two miscarriages and bore four children, all dying in early life of various affections. Upon the administration of potassium iodide the pains ceased, the mobility of the affected joints was restored, and the deformity of the fingers and toes gradually disappeared. Some time later ulceration of the tongue took place, occasioning pain in speaking and swallowing. This failed to respond to the ordinary methods employed, but soon subsided after the administration of potassium iodide. The diagnosis of syphilis seems thus to have been established. It is explained that the syphilitic virus exerted an influence analogous to that exerted by the toxic matters present in cases of bronchiectasis and empyema attended with hypertrophic osteo-arthritis.

THE REFLEXES IN SPINAL INJURIES.

MR. WM. THORBURN (Manchester) communicates in the *Medical Chronicle* (vol. xvi., No. 2) an analytical review of 29 cases of injuries to the cervical or dorsal regions of the cord which confirm the views enunciated by Dr. H. Charlton Bastian, two years ago, in the *Medico-Chirurgical Transactions* (vol. lxxiii.). He concludes that in *total* transverse lesions of the cord both the superficial and the deep reflexes are permanently and entirely abolished, and that in *partial* lesions only are retention or exaggeration of these reflexes met with.

QUANTITATIVE DETERMINATION OF THE RED AND WHITE BLOOD-CORPUSCLES IN HEALTH AND DISEASE.

DALAND (*Fortschritte der Medicin*, Bd. ix., Nos. 20 and 21) has recorded the results of observations made at the clinic of Von Jaksch as to the value of the hæmatokrit in the volumetric study of the red and white corpuscles in human blood in health and disease. He found that the best diluting fluid was a two and a half per cent. solution of potassium permanganate. In fifty-five healthy adult males the average volume of red corpuscles, as determined by the hæmatokrit, was 51.6 per cent.; while the average number among seventeen observers, as determined by the hæmocytometer, was 5,130,248. One per cent. of volume is therefore the equivalent of about 100,000 red blood-corpuscles. It was shown that, in spite of the most scrupulous care, the results obtained by means of the hæmocytometer in the hands of competent observers was most variable. The two chief sources of error reside in the difficulty of

securing an equable dilution and an equable distribution of the blood. For purposes of accuracy, one should prepare not less than two (or, better, four) slides and count in each the contents of not less than sixty-four squares. The hæmatokrit gives results as accurate as, if not more accurate than, those of the hæmocytometer; while its employment requires less skill, demands less eye-strain, and occupies less time.

PRIMARY SARCOMA OF THE THYMUS GLAND, SIMULATING LYMPHATIC LEUKÆMIA AND FOLLOWED BY SARCOMATOSIS.

PALMA (*Deutsche medicin. Wochenschr.*, 1892, No. 35, p. 784) has reported the case of a man, eighteen years old, a shoemaker, who for three months had slight hoarseness and cough, with scanty expectoration. To these symptoms a painless swelling in the left inguinal fossa was added. There was no history of syphilis or of alcoholism. The urine contained a small quantity of albumin, but no other abnormal ingredient. The number of red blood-corpuscles and the percentage of hæmoglobin were slightly below the normal; the proportion of colorless to red corpuscles, 1 : 254. The eosinophile cells were not in excess. Repeated examination failed to detect tubercle-bacilli in the sputum. The lymphatic glands in the right groin, in the neck, and in the axillæ were also found to be enlarged. On physical exploration, the pulmonary percussion resonance was found to be impaired at the upper portion of the left chest, with enfeeblement of the respiratory murmur and some fine râles and wheezing. On the right side, low down, small moist râles were heard. The spleen was not enlarged. A series of injections of tuberculin were attended with elevation of temperature. The impairment of resonance upon the left side increased in intensity and in extent, until it became inseparable from the cardiac dulness. Cough persisted, with frothy expectoration, while dyspnœa and cyanosis became marked. Œdema about the ankles set in, although now the presence of albumin in the urine could not be detected. There was increased diminution in the number of red blood-corpuscles and in the percentage of hæmoglobin, while the colorless corpuscles were to the red as 1 : 455. After two months the number of red cells had become reduced to almost half of the normal, the percentage of hæmoglobin to thirty-three, and the proportion of colorless to red cells 1 : 7.3. Ophthalmoscopic examination disclosed the existence of hemorrhages about both papillæ. The symptoms grew progressively more marked and the condition of the man worse, until death took place in dyspnœa. At the post-mortem examination a tumor, as large as two fists, was found in the anterior mediastinum, surrounding the superior vena cava and its branches, and the large vessels given off from the arch of the aorta, extending into the pericardium and to the visceral pleura of the upper portions of both lungs. On section, the growth appeared medullary, white in color and firm in consistence, and in places presented slight hemorrhages. All of the mediastinal lymphatic glands were enlarged, of medullary consistence, and partially infiltrated with blood. The lungs were universally adherent, atelectatic in the upper portions and in places containing lobules of recent hemorrhagic infiltration. The pericardial cavity contained between six and seven ounces of blood-stained serum, and a mass of new-growth made up of nodules as large as

hazel-nuts, and in places involving also the muscular structure of the heart; the serous membrane was in places ecchymotic. The kidneys were pale and rather large; they contained numerous small abscesses surrounded by areas of hemorrhagic infiltration. The extra-peritoneal, as well as the inguinal, the axillary, and the cervical lymphatic glands were enlarged. The mucous membrane of the stomach and the testicles was ecchymotic. On the inner surface of the dura mater, over the convexity of the cerebrum, were delicate layers of recently extravasated blood. Sections of the new-growth in the mediastinum, and of the various enlarged glands, disclosed the structure of a round-celled sarcoma. The liver and the spleen contained cells resembling those found in the new-growth.

SURGERY.

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FURTHER REPORT ON ASEPTIC AND SEPTIC SURGICAL CASES, WITH SPECIAL REFERENCE TO INFECTION OF THE SKIN.

LOCKWOOD, in the *British Medical Journal*, May 28, 1892, continues the report which appeared in the issue of the same journal of October 25, 1890. Inoculations on culture media have been continued. A few wounds have remained sterile; these cases are cited. As a rule, however, microbes could be demonstrated. Bloch, in a series of forty-six cases, secured aseptic wounds in but two instances. Halstead has also demonstrated pyogenic organisms in wounds after operations performed in the most careful manner.

Lockwood says: "There is no plan which can allow the so-called harmless microbes to enter a wound and at the same time keep out the harmful. Nor can we rely upon the vital resistance, phagocytic power, or microbe-destroying properties of the fluids and tissues of the body. They are factors beyond control, while asepticism is not."

The skin also harbors the *staphylococcus aureus* and *albus*, as well as others which are pathogenic for man. Aseptic surgery must therefore look for advancement to a more thorough means of disinfecting the skin, and to this object many surgeons are now directing their attention.

In the first place, when proper care is exercised in preparing the materials

used in the performance of the operation, the sources of infection can be narrowed down to (a) the hands of the operator and of his assistants, and (b) the skin of the patient. The atmosphere is not a danger. The culture-tubes have been left open for hours in operating theatres and rooms, and they have not become infected; and gelatin spread out in dishes has had the same immunity. But any danger of infection from the atmosphere has been provided for by filling the wounds with perchloride of mercury lotion, 1 in 2000, squeezed from a sponge, or; in large and deep wounds, discharged from an irrigator.

It is quite otherwise as regards the skin of the surgeon's hands and arms. A great deal has been written about the sterilization of the hands and of the skin, but it is evident that the usual precautions are not sufficient.

In a case of removal of a chronic mammary tumor, although the skin had been washed and scrubbed until the woman complained, had been washed in 5 per cent. carbolic solution, covered for eighteen hours with an antiseptic dressing, and finally washed just before the operation with perchloride of mercury lotion, 1 in 1000, nevertheless a bit of this skin infected culture-tubes with cocci, streptococci, diplococci, and bacilli such as are usually found in the skin. The reason for this failure to disinfect the skin was shown in the following way:

A cover-glass preparation of the contents of a sebaceous gland stained with fuchsin shows that sebum is a mass of cocci, diplococci, and bacilli, together with occasional epithelial cells. After an area which has numerous sebaceous glands had been washed with soap and water, then with perchloride of mercury lotion, 1 in 1000, and lastly with absolute alcohol, its glands were squeezed and cultures inoculated from its surface. The result was a plentiful growth of long and short bacilli, leptothrix, monococci, diplococci, and staphylococci. In a similar way the properties of the sweat glands were shown. A perspiring surface was washed with soap and water, then with perchloride of mercury lotion, 1 in 1000, and afterward with absolute alcohol. As soon as the sweat reappeared, nutrient material was inoculated with it, and grew quantities of staphylococci, and in old cultures some bacilli and leptothrix. Thus there was a slight difference in the first results of these experiments. Sweat glands gave a growth of cocci with few bacilli, whilst sebaceous glands gave bacilli with few cocci.

It was found that when a fluid composed of skin scrapings suspended in normal saline solution was injected into the auricular veins of rabbits, some died at once—killed, perhaps, by the coarse particles; others died some days or weeks afterward. A strong, healthy animal wasted and died twelve days after the injection. It had diarrhoea, and its cage was constantly wet. In another the symptoms were the same, but there was also suppuration at the seat of inoculation, and a considerable inflammatory oedema of its neck. After it had been killed, infarcts were found in its kidneys, and there were areas of pleuro-pneumonia in the lungs. In another animal the kidneys seemed to have escaped, but the lungs contained many infarcts.

These effects might possibly have been caused by the particles of epidermis, and therefore the experiments were repeated with gelatin cultures which had been inoculated with the same kind of fluid—namely, normal saline solution mixed with skin scrapings. The gelatin was rapidly liquified, and

contained a great many kinds of microbes—cocci of various sizes, diplococci, staphylococci, chains of from four to twelve cocci, some consisting of large, others of small elements, numbers of very small short bacilli aggregated into small groups, a larger spore-containing bacillus with rounded ends, and leptothrix. This fluid seemed more virulent than a mere solution of skin scrapings. An intra-venous inoculation of from five to ten drops soon made the rabbits ill; they ceased to feed and became emaciated, and their cages were constantly wet. The lungs were the organs most attacked, and in the early stages were engorged and inflamed, especially at their periphery.

Thus the skin contains microbes which are pathogenic for mice and rabbits. But it also constantly harbors staphylococcus aureus and staphylococcus albus, which are pathogenic for man, and Eisenberg gives a list of others which, if less known, are equally dangerous.

THE TECHNIQUE OF ANTISEPTIC WOUND-TREATMENT.

NEUBER (*Centralblatt für Chirurgie*, 1892, No. 19) describes the advantages of treating wounds by modern Listerian methods. By infrequent dressings and the rest obtained in consequence, wounds heal much more rapidly. The author objects to the layer of mackintosh which was formerly included in the superficial layers of gauze. Drainage-tubes are used only in exceptional cases. Strong antiseptic irrigations add greatly to the subsequent oozing, and, consequently, are to be avoided when it is possible, as drainage, which otherwise might have been dispensed with, is thus made necessary. The object should be to prevent the entrance of pathogenic germs into the wound—asepsis.

In his hospital practice, Neuber enjoins the most scrupulous cleanliness and the avoidance of overcrowding. His patients are received in undressing-rooms, with which bath-rooms are connected; after proper preparation, they are taken into the room where the examination of the patient is made. This room connects with the operation-rooms. These same appointments exist for different classes of cases. Septic cases are kept quite apart from those free from infection.

In operating, the fewer hands that come in contact with the wound the better. Instruments are sterilized by boiling—then placed in a 1 per cent. carbolic solution. As a rule, the assistant should not touch the wound, except with instruments. Rapidity is advised, as it lessens the length of the exposure to contaminating influences. With this object in view, free incisions should be made in order to give easy access to the deeper parts of the wound and facilitate the necessary manipulations. Large wounds should be irrigated either with sterilized water or sterilized 0.6 per cent. salt solution. Hemorrhage is to be arrested as far as possible by torsion; if this does not suffice, the vessel is to be tied with catgut. Sterilized sponges are employed. When ready for the sutures, the wound is packed with boiled antiseptic gauze, and the stitches passed closely together, so as entirely to close the margins. Some of the sterilized sponges are then covered with the boiled gauze and applied to the outside of the wound, by means of which the assistant keeps up a constant pressure, while the gauze is being withdrawn from the inside and the sutures tied. All secretions and blood-clots come away

with the gauze, leaving a dry wound. Under these circumstances drainage becomes unnecessary, except when considerable parenchymatous oozing is expected, as in operations on bones. The dressing may be completed by fixing the gauze-covered sponges with adhesive strips and a bandage. With this method wounds heal by first intention, without direct use of an antiseptic, and frequently with but a single dressing.

SHOCK AND ITS TREATMENT.

KOTTMANN (*Wiener med. Presse*, 1892, No. 21, from *Correspondenzblatt für Schweizer Aerzte*) states that the most important signs of shock are weakness of the heart, faint respiration, skin pale and covered with cold sweat; face drawn out, sunken eyes and livid lips; consciousness remains; sensibility reduced. Shock appears when certain very sensitive organs, as testicles, bones, or bowels have been subjected to contusion or other serious injury. Shock may occur from hemorrhage, and is then associated with functional changes in the body of which there are no post-mortem evidences. Two theories are advanced: the first defines shock as a reflex paralysis of the heart and vessels caused by the trauma. According to the second the injury causes, reflexly, exhaustion of the medulla oblongata and of the spinal cord, and, as the nerve centres are affected, there is debility of heart and respiration. The fever which accompanies shock is, according to Kottmann, the consequence of trauma. The substances causing the fever are here chemical, and not bacterial, are freed from normal tissue matter by the injury, and include hæmoglobin, fibrin firment, and similar elements. The author objects to confounding shock with debility due to hemorrhage. In the latter there is rapid pulse, quick, deep, panting respiration. In shock, the patient does not present the evidences of cerebral irritation, noises in the ears, affected vision, palpitation, yawning, and even convulsions. In severe cases of shock the usual remedies—alcohol, ether, caffeine, and camphor—may be used without relief. The similarity in the appearances resulting from hemorrhage and from shock induced Kottmann to use salt-water transfusion in four cases, with good results. By the neuro-pathological theory the explanation is that the effect of the salt solution is to stimulate the centres with which it comes in contact, and with increased arterial pressure the central nervous system would receive more blood and recuperate more quickly. If the hæmo-pathological theory is accepted the explanation is even more simple: the salt-water would fill the empty heart and vessels, and the hydraulic requirements would be fulfilled while the blood in the distended abdominal vessels was being restored to the circulation. Patients suffering from shock often require severe operations, especially the amputation of members. Experience shows that chloroform anæsthesia in these cases is attended with unusual danger; which is less with ether, which acts as a heart stimulant.

PENETRATING GUNSHOT WOUNDS.

SELIGER (*Prager medicinische Wochenschrift*, 1892, No. 12), after an elaborate study of gunshot wounds, arrives at the following conclusions: Gunshot wounds of the abdomen are received anteriorly four times as frequently

as in the back; the mortality was 54 per cent., and in those cases complicated with bone lesions, 78 per cent. If the ball passed through, the mortality was 42 per cent.; but if the ball or other projectile remained inside, it was 65 per cent. The complication of opening the chest cavity was nearly always fatal, even if only the pleural cavity had been opened, without lung injury. In 236 cases of death, 98 occurred in the first week, 38 in the second, 28 in the third, 14 in the fourth, and 12 in the fifth week. The causes of death in the first period were hemorrhage and peritonitis. From tenth to fortieth day: septicæmia, pyæmia, secondary peritonitis. From fortieth day: peritonitis, pyæmia, septicæmia, marasmus. Recovery took place in some cases after very long illnesses.

Sometimes a ball penetrates the abdominal cavity without causing a wound of the intestines. Frequently there exists hernia of intestines without other lesion; this makes the prognosis worse. Gunshot wounds of the mesentery become fatal through wounds to vessels, otherwise the prognosis is good. Gunshot wounds of the stomach generally end fatally. Duodenal gunshot wounds are always fatal. Complete healing of gunshot wounds of small intestine is rare. In the large intestine, the lesions of the descending colon and sigmoid flexure are seldom fatal, but the prognosis as to the cecum and ascending colon is worse, and worse still are lesions of the transverse colon. Subsequent fistula is the rule, which may persist as long as four years. These fistulæ, as well as adhesions, strictures and abnormal communications which are found especially in gunshot wounds of the rectum, give rise to extremely obstinate conditions. The intra-peritoneal gunshot wounds of the bladder are always fatal; in the extra-peritoneal there is only 15 per cent. mortality. Gunshot wounds of the kidneys are recognized by hemorrhage, besides position of the wound and direction of the same, and perhaps kidney colic; mortality, 44 per cent. Fistulæ of the kidney in these cases remain for a long time. Also, chronic inflammation of the parenchyma, which may be the cause of calculi. In gunshot wounds of the liver, which can be recognized by the position and direction of the wound, by discharge of bile and necrotic pieces of liver, and also at times by jaundice, are frequently complicated with wounds of other organs; mortality, 26.8 per cent., some authors give it as 39 per cent. As consequences, abscesses are seldom mentioned, but bile fistulæ frequently persist for a long time. In one case cirrhosis followed in consequence of remaining foreign bodies. Lesions of the spleen are also frequently complicated with lesions of other organs. Diagnosis is very difficult; mortality, 65 per cent.

Functional troubles of the lumbar part of the spinal cord in lesions of the substance of the cord, appear according to the extent of the lesion, either total or partial. Hemorrhages in the canal, without injury to the cord, give later evidences in proportion to the extent of the hemorrhage. These may be functional troubles, which may cause simple reflex paralysis lasting a long time, or paralysis of the legs and sphincters of bladder and rectum, anæsthesias, and later, bedsores. The result of lesion of the substance is usually death; the prognosis is better in hemorrhages, and also in lesions of the lumbar spine if the wound closes soon. The diagnosis of lesions of the sexual organs is easy, and the prognosis as regards life is good. The conse-

quences may be urethral fistulæ, persisting for a long time, splitting of the penis, and scar-formations as long-lasting malformations. After the loss of both testicles there is impotence; at times deep depression of mind follows. The cure of gunshot wounds of the larger abdominal vessels without surgical interference is a rarity. Hemorrhages may be caused by the projectiles or by bone splinters, direct or secondary, in consequence of diseases of the wound or erosion of the vessel walls. Lesions of the pelvis give a high mortality. Death follows after long-standing suppuration, by exhaustion and amyloid degeneration. The treatment is in many of these cases a very difficult question to decide. Generally the idea prevails that gunshot wounds of the intestine in civil practice should be submitted to laparotomy as soon as possible, to repair the wound in the intestine and control possible hemorrhages. In lesions of the kidneys, the total extirpation of the organ is indicated; useless examination with fingers and probes is to be avoided; in all manipulations and operations, the most thorough antiseptic measures must be employed.

THE PRESENT POSITION OF GALL-BLADDER SURGERY.

CZERNY (*Deutsche medicinische Wochenschrift*, 1892, No. 23), after a general consideration of gall-bladder surgery, presents the following conclusions:

1. Gall-stones require operation, if they cause frequently repeated or lasting trouble.

2. Empyema of the gall-bladder imperatively demands operation, as does hydrops, if it gives serious trouble.

3. The typical operation for gall-stones consists in incision, removal of the stones, and suture of the gall-bladder; in this, however, the abdominal wound should be drained for a short time.

4. If the cystic duct is closed, if the gall-bladder is the seat of inflammation, or its contents are greatly altered, then a temporary gall-bladder fistula must be made.

5. Extirpation of the gall-bladder is indicated only in cases of severe inflammatory or carcinomatous involvement.

6. When the ductus choledochus is closed, the operation is absolutely indicated if the strength of the patient will permit. If one does not succeed in removing the stone or obstruction, then it is recommended to produce a fistula between the gall-bladder and duodenum.

7. The best incision for gall-bladder operations is an J-shaped cut; the vertical limb lies in the linea alba and the horizontal part runs toward the right just below the level of the umbilicus.

8. The danger to life in gall-stone operations will be probably less than in operations for vesical calculus.

METHODS OF OPERATION FOR CARCINOMA OF THE RECTUM, AND THE FINAL RESULTS OF THE SAME.

SCHMIDT, in the *Berliner klinische Wochenschrift*, 1892, No. 24, reports fifty-nine cases of operation for carcinoma of the rectum from Czerny's clinic.

The methods of operation proposed can be divided into (1) those that attempt to remove the rectum from the perineum, and (2) the sacral method by osteo-plastic resection of the sacrum, with the object of removing the carcinomatous growth only when possible.

Of the 59 cases, 25 have been reported as having died. From 6 cases information could not be obtained; 28 are living, of which 10 were subjected to the perineal operation, and in 18 the sacral method was employed; 12 patients have passed the critical period of two years. The greatest prolongation of life after operation was five and three-quarters years. Four of these 12 cases have visible recurrences, one of which is operable. The reports of the patients have been satisfactory. Weight and nutrition have increased, and most of them follow their occupation as before.

The question of continence is one of great importance to the patient. Absolute continence was secured in the sacral operation only, in cases in which it was possible to perform a circular suture of the canal. Very nearly perfect control was obtained in cases in which the split sphincter was united to the proximal end of the gut. In the perineal operations, relative continence was obtained. The author looks for a diminished mortality with improvement in the technique of the operation.

GASTRORRHAPHY FOR DIMINISHING THE SIZE OF A DILATED STOMACH.

WEIR reports in the *New York Medical Journal*, vol. lvi., No. 2, the case of a man, aged forty-one years, on whom he had performed gastro-enterostomy for pyloric stenosis of two years' duration. The stomach was found to be so dilated that it would contain eight or ten pints of fluid. Rapid recovery followed the operation. A year later the patient again presented himself on account of a return of his former symptoms of vomiting and gastric distress. Weir first thought that the gastro-enteric opening had contracted unduly, although made of larger dimensions than is usually recommended. It was found, however, that air pumped into the stomach could be heard with the stethoscope in the intestines. Washing out the stomach temporarily relieved his vomiting. It was finally concluded that the extreme dilatation of the stomach would explain the symptoms present, and it was decided to perform gastrorrhaphy in the hope of giving relief. The operation was performed as follows: Midway between the upper and lower borders of the stomach a dimpling in of the gastric wall, an inch in depth, was accomplished by the pressure of a sound. A row of interrupted silk sutures was now introduced, passing through the serous and muscular coats, and the sound withdrawn. A second, third, and fourth row of sutures were introduced parallel to the first and in a similar manner. The patient was nourished by enemata for the first six days, when gradually liquids were given by the mouth. At the end of the fourth week he was taking his usual diet. Since the operation, now four months, the patient has not had a single instance of vomiting and he has been free from distress, and at the same time he has gained in strength and weight.

Weir supposed he was about to perform a new operation, but two days

before operating he learned that it had already been performed by Bircher, of Switzerland, in three cases, all of which were successful.

POTT'S FRACTURE AT THE ANKLE.

STIMSON, in the *New York Medical Journal*, vol. lv., No. 26, calls attention to certain features connected with Pott's fracture that have been very generally overlooked. His observations include a large experience in treating these fractures, experiments on the cadaver, and post-mortem dissections. Pott's fracture is defined as an "injury produced usually by a forcible twist of the foot outward, and consisting (typically) of, (1) a fracture of the fibula from one to three inches above the tip of the malleolus; (2) a fracture of the internal malleolus or a rupture of the internal lateral ligament; and (3) a diastasis of the lower tibio-fibular articulation with rupture of its ligaments, or possibly with avulsion of the adjoining portion of the tibia."

Second in clinical prominence to the fracture of the fibula is the fracture of the internal malleolus, or rupture of its ligament; the latter is the more frequent. In two cases under the author's care the internal malleolus was broken squarely off at its base, and had undergone a rotation of 90 degrees on its anterior-posterior axis, so that the fractured surface lay just beneath the skin. In still two other cases there was exceptional prominence and mobility of the fractured internal malleolus. In all four cases the fragments were exposed by incision, and replaced. Prompt recovery with full restoration of function took place in all four cases.

Stimson holds that the rupture of the tibio-fibular ligaments is the essential lesion of this injury—one which vastly outweighs the fracture of the fibula in importance, and one without which the lesions on the inner side of the ankle would probably be impossible. Unless especially sought for, this diastasis of the tibio-fibular articulation may readily be overlooked. The effect of this lesion is to loosen the mortise into which the astragalus fits, which permits this bone to become displaced outward, and at times backward as well. Without correction of these displacements satisfactory recovery cannot be expected.

This injury may be recognized by pain on pressure with the tip of the finger at the junction of the two bones in front close above the articular edge of the tibia, and by abnormal lateral mobility, demonstrated by grasping the foot with the hand so that the posterior portion of the sole rests in the palm of the hand, and then moving the foot bodily inward and outward while the other hand steadies the leg above the ankle. Backward displacement may be recognized by moving the foot bodily forward.

The chief indication for treatment is to restore the external malleolus to its position in contact with the tibia and to retain it there. For retention, the author prefers moulded plaster-of-Paris splints. They may be made of the ordinary four-inch plaster roller, folded back and forth until some twelve or fifteen thicknesses are applied. A posterior or lateral splint may be used. If the former is employed, it should begin at the toes, extend along the sole, around the heel and up the calf nearly to the knee. The lateral splint should begin just in front of the external malleolus, pass over the dorsum of the

foot to the inner side, under the sole, and upward along the outer side of the leg. They are bound to the leg while wet, with an ordinary roller bandage which may be removed after the plaster has set, when a few turns are applied just above the ankle and at the upper extremity of the splint.

OBSTETRICS.

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THE PATHOLOGICAL ANATOMY IN CASES OF OBSTINATE VOMITING DURING PREGNANCY.

An interesting series of investigations upon this question has been undertaken by LINDENMANN, of Moscow, whose results are published in the *Centralblatt für Pathologie*, 1892, No. 15. He examined microscopically the tissues of a mother and fœtus who perished from obstinate vomiting, having as a complication polyneuritis. A gross examination revealed enlargement of the spleen with the usual appearance of inanition. The kidneys and liver were cirrhotic. Microscopic examination revealed neuritis of the phrenic, pneumogastric, median, and peroneal nerves, especially well marked in the case of the phrenic nerve. The liver was in a condition of fatty degeneration and cloudy swelling. The spleen showed dilated bloodvessels and blood-corpuscles which refused to take coloring material. The kidneys were free from evidence of inflammation, but showed fatty degeneration of the epithelium.

The organs of the fœtus exhibited marked degeneration in the kidneys and liver. In the liver the protoplasm of the cells was in a condition of beginning fatty degeneration, while fat-drops were perceptible in some portions. The kidneys gave examples of atrophy and necrosis of a degenerative but not inflammatory character. The epithelium was in the condition known as coagulation necrosis. The neuritis and enlargement of the spleen are phenomena which cannot be accounted for by inanition alone; the entire pathological picture is that of chronic infection; the clinical history betrayed no source of poisoning, and the existence of a toxine is the most rational explanation of the phenomena.

There is every reason to believe, however, that auto-intoxication is the basis for pernicious vomiting of pregnancy as it is for eclampsia. The

present case shows clearly the participation of the fœtus in the disorders of the mother. In connection with this research Lindenmann made interesting observations on the pathology of inanition in animals, and was able to exclude by comparison simple inanition as a cause for the lesions in the case reported.

CÆSAREAN SECTION WITH OÖPHORECTOMY FOR OSTEOMALACIA.

SOLOWIJ reports in the *Centralblatt für Gynäkologie*, 1892, No. 38, the case of a multipara, aged twenty-six years, who suffered from osteomalacia. She had constant pain in the bones, which were sensitive to pressure, and, in addition, a contracted pelvis which forbade the birth of a fully developed child. Accordingly, the Cæsarean operation was performed at the beginning of labor; the uterus was raised from the abdominal cavity and the fœtus quickly removed. After suturing the uterus, the ovaries were found and removed. They were exceedingly atrophic, and were discovered with difficulty. The patient made a good recovery, adhesion between the uterus and the lower portion of the abdominal incision taking place during the healing.

GENERAL DROPSY OF THE FŒTUS.

This puzzling condition has been made the subject of study by BALLANTYNE, who writes in the *Edinburgh Medical Journal*, September, 1892, regarding it. He concludes that while in some cases there exists an adequate cause in the fœtus itself, in most the disease is due to a chain of factors embracing a cachectic state of the mother and diseased blood in the fœtus, and dependent upon a morbid condition of the endometrium and the placenta.

MAMMARY FISTULA.

CHOLMOGOROFF reports in the *Centralblatt für Gynäkologie*, 1892, No. 38, an interesting case of this uncommon affection. The patient was a multipara, twenty-four years old; while nursing her fourth child she was taken with mastitis of the right side, attended by severe pain and moderate fever. She was treated by a midwife with fomentations and plasters. A week later pus emerged from the breast through three small openings on the outer side of the nipple. Her temperature fell, but another abscess formed, and she came under medical care. Upon examination, two of the openings had closed; from the third pure pus emerged; on the inner side of the areola the breast was swollen and fluctuation was evident. Over this point a free incision was made, pus freely evacuated, and drainage and antiseptic dressing applied. There was no milk in this breast, and on the other side the secretion also failed; the child was weaned.

A month later another abscess was opened beneath the nipple. Two months later the first openings had healed. Where incisions had been made fistulæ remained, from which came pus and a small amount of milk. The patient was about six weeks pregnant. A few days later the secretion of milk from both fistulæ considerably increased. A new abscess formed and was opened and drained; from this wound pure pus was discharged, while from the old fistula came an abundant flow of milk. The edges of the milk

fistulæ were cauterized to prevent maceration of the surrounding skin. The last abscess healed, but milk continued to come from the fistulæ. The milk fistulæ were finally healed by the application, as a stimulant to granulation, of chloral hydrate in crystals. While this was more painful than nitrate of silver, healing followed more rapidly. All the fistulæ finally closed; the pregnancy assumed a normal course.

THE ETIOLOGY OF INTRA-UTERINE FRACTURES.

A valuable paper upon this subject, accompanied by illustrations, is published by SPERLING in the *Zeitschrift für Geburtshülfe und Gynäkologie*, 1892, Band xxiv., Heft 2. The results attained by this research may be summarized as follows: Many cases of alleged intra-uterine fractures, especially of the lower extremities, are malformations and not fractures at all. These defects have, as a rule, nothing to do with a fracture should one be found in addition. Fracture and malformation are not produced by a common and contemporaneous cause; malformations undoubtedly occur in the first and second months of intra-uterine life, and are most rationally referred to amniotic adhesions. Bending and malformation of the extremities in these cases of supposed fracture find their most rational explanation in a precipitate flexion of undifferentiated layers in the embryo; the presence of an apparent scar is not an evidence of fracture.

It is exceedingly doubtful if external violence can produce fracture of the foetal thigh, as the foetus is so well protected by the amniotic liquid. If intra-uterine force be held to be the cause of such fracture, such can only occur during contractions of the uterus; there is, however, no case clearly proven in which, during the stage of dilatation or of expulsion, uterine contractions alone have caused fracture; the great frequency of births at full term, accompanied by so-called intra-uterine fracture, renders the theory that such fractures are caused by the irritation of the uterus in premature birth scarcely probable. In cases of fracture of the foetal skull following severe injury to the mother's abdomen, rupture of the uterus is usually produced, and this explains the occurrence of the foetal fracture.

In so-called intra-uterine fracture of the thigh it is indisputable that but little callus is present, although the conditions are favorable for a very free development of callus. In fractures of the clavicle, the occurrence of considerable callus is best explained by defect in the development of the clavicle during embryonic life. The conditions of embryonic life account for the small amount of callus in malformations of the inferior extremities. Fractures of the lower extremities with free development of callus show no defect in the fibula or in the toes, such as is observed in cases of lack of development. A microscopic examination in a case of flexion of the bones of the forearm in a newborn child, with thickening of the bones at the point of deformity, but without defect in the fingers, showed the same pathological processes, and no characteristic callus of fracture.

The conclusion of Sperling's research is that most of the cases where fractures of the bones of the extremities are supposed to have occurred *in utero* through violence are clearly cases of malformation and defective development.

AN ANALYSIS OF TWENTY-FIVE CASES OF HYDATIDIFORM MOLE.

CRAIGIN reports in the *Boston Medical and Surgical Journal*, 1892, No. 10, the results of his observations upon this subject. He finds that primiparæ are not rarely affected, patients being younger than generally supposed; any of the signs of normal pregnancy may be present. Œdema without albuminuria may be present, and uræmia may be a complication. The discharge of thin, watery blood, with occasional cysts, which has been described as typical, is often lacking. The flow frequently resembles pure blood so closely as to be mistaken for it. Profuse hemorrhage is not rare.

In diagnosis, in the early months it is often impossible. The passage of a sound will often bring away cysts.

So far as treatment is concerned, the uterus should be emptied as soon as possible. Where the cervix is long and the os rigid, a firm vaginal tampon should be employed. When the tampon is removed there is great danger of hemorrhage unless delivery is accomplished. So soon as the os and cervix have softened under the use of the tampon, rapid dilatation by the hand or by an instrument should be performed, and the uterus thoroughly emptied. Hemorrhage will be usually profuse, but will cease when the uterus is emptied. Under antiseptic precautions, mortality is low; in the twenty-five cases, three perished, one of whom was beyond help when first seen; another died of secondary cancer, and one from septicæmia.

 THE MODIFICATION OF LABOR IN CASES OF EXTREME MACERATION OF THE FŒTUS.

TOWNSEND, in the *Boston Medical and Surgical Journal*, 1892, No. 10, describes eight cases of labor, and has examined the records of eighty cases, in which the fœtus was greatly macerated. In these cases expulsive pains failed and dilatation of the birth-canal was deficient. It was necessary to deliver the patients by manual interference; in some of the cases, under anæsthesia, in others without. The uterus not infrequently becomes exhausted, and pains cease, not because expulsion is not in progress, but because the uterine muscle has become tired. The os and cervix in such cases are usually tense, and the attendant may be led into the error of supposing that labor has entirely ceased and that interference is not demanded. On the contrary, in cases where contractions have apparently ceased, leaving the os and cervix partly dilated, but firm, the indication is to anæsthetize the patient and complete the delivery.

 OVARIOTOMY DURING PREGNANCY.

In the *Archiv für Gynäkologie*, 1892, Band xlii., Heft 3, DSIRNE states the conclusions drawn from the records of 135 cases of ovarian cysts complicating pregnancy. From this study he believes that the complication is a very dangerous one to the pregnant woman, and that the danger increases as pregnancy advances. Tapping the cyst and terminating pregnancy are alike unnecessary; ovariectomy gives the best results for the mother in the second,

third, and fourth months of pregnancy, and for the fœtus during the third and fourth months. When ovariectomy cannot be performed early in pregnancy, it is still possible to obtain good results by a late operation.

A CONTRIBUTION TO THE STUDY OF THE LOWER UTERINE SEGMENT.

DE SEIGNEUX describes, in the *Archiv für Gynäkologie*, 1892, Band xlii., Heft 3, his observations upon this subject based upon the post-mortem examination of three cases. In these cases the lower uterine segment was clearly a part of the uterus, and not of its cervix. At the fifth month the posterior wall of the inferior segment is not developed, while the anterior wall is very small. In the parturient and puerperal uterus there is no line of division between the uterine segment and the body, but a progressive thinning of the uterine walls exists, extending to the cervix. No contraction ring could be demonstrated. The puerperal uterus showed microscopic differences in the arrangement of its muscle between the upper and lower portions. No especial difference of structure was observed on microscopic examination. In the preparations examined, the circular arrangement of bands of muscle already described by Hofmeier was also observed.

THE TREATMENT OF ECLAMPSIA.

In an extended review of the literature of this subject, DÜHRSEN advises dilatation of the uterus, if necessary, accompanied by multiple incisions of the cervix and prompt delivery, followed by the use of the iodoform-gauze tampon in cases of hemorrhage. His experience has been so successful with this method that he earnestly commends it after the eighth month of pregnancy as preferable to the Cæsarean section and to less prompt methods of delivery. Surgical narcosis is necessary, and the entire procedure must be accompanied by careful antisepsis.—*Archiv für Gynäkologie*, 1892, Band xlii., Heft 3.

GYNÆCOLOGY.

UNDER THE CHARGE OF

HENRY C. COE, M.D., M.R.C.S.,
OF NEW YORK.

VENTRO-FIXATION OF THE UTERUS.

SPAETH (*Münchener med. Wochenschrift*, 1892, No. 27) reports twenty-five cases from Prochownik's private clinic, the patients being under observation from six months to six years. In all but four cases the cure was permanent. Pregnancy did not occur in any instance.

CYSTS OF THE HYMEN.

GÖRL (*Archiv für Gynäkologie*, Band xlv., Heft 3) reports a case of this rare condition, being the first on record in which it was noted in an adult. All the others were in newborn infants. Two theories have been advanced to account for the formation of these cysts; according to some they arise from the coalescence of the free edges of the converging folds of the hymen, while Ziegenspeck believes that they develop by ingrowth of the epithelium covering the hymen into the subjacent tissue, the follicle thus formed becoming closed so as to form a cyst. The latter seems to be the more probable explanation.

CARCINOMA AND ENDOTHELIOMA OF THE OVARY.

MÜLLER (*Ibid.*) concludes a lengthy article on this subject with these deductions: 1. If epithelial cells penetrate the blood or lymphatic vessels of the ovary and begin to grow, a histological picture is presented which is often not to be distinguished from endothelioma. 2. True carcinoma develops in the lumina of the vessels, and the formation of papillary projections in the interstitial spaces has not yet been observed; in doubtful cases this may serve as an important point in the differential diagnosis.

ASCITES IN ITS RELATION TO GYNECOLOGY.

GUSSEROW (*Ibid.*) divides cases of ascites which come under the observation of the abdominal surgeon into four classes—those due to tuberculosis, to papilloma of the ovaries, to malignant disease of the ovaries and peritoneum, and to non-malignant conditions of the genital organs. He proves by numerous cases that it is impossible to make a positive diagnosis by means of explorative puncture alone, and pleads for the explorative incision instead, as being equally harmless. Moreover, it is frequently found when the finger is introduced that the cause of the ascites is removable, and that the patient can be cured at once by removal of the neoplasm.

CYSTS OF THE PANCREAS.

KRECKE (*Münchener med. Wochenschrift*, 1892, No. 26) concludes a careful review of the literature of these rare cysts, with some observations on the diagnosis and treatment. They are most apt to be mistaken for ovarian cystomata. It is important to note their origin in the upper half of the abdominal cavity and their relation to the colon and stomach. Renal tumors develop from either lumbar region, and bear a different relation to the transverse colon. The presence of a cyst of the pancreas is to be suspected when there is found a fluctuating tumor in the region of the umbilicus, which has appeared after an injury or following an attack of gastro-enteritis. Examination shows that it lies behind the stomach and colon. The patient usually has attacks of severe cardialgia and becomes emaciated. Explorative puncture throws little or no light on the diagnosis, and is not devoid of danger.

Thirty-four cases have been reported in which operative interference was attempted. In seven the cyst was extirpated, with a mortality of 57 per cent. Twenty-seven were treated by incision and drainage, all the patients recovering; most of them were permanently cured. The latter procedure is accordingly preferable to extirpation.

PARTIAL NON-DEVELOPMENT OF THE UTERUS.

SCHAUTA (*Internationale klin. Rundschau*, 1892, No. 32) calls attention to a little known form of defective uterine development in which the organ as a whole appears to be perfectly normal, but some portions of its wall are congenitally thinner than others. In a case in Prague both Breisky and himself noted during successive labors that in one spot near the right horn of the parturient uterus the wall was so attenuated that it bulged out, giving the impression of an adherent ovarian cyst; the fetal parts could be distinctly felt, during a labor-pain, inside of this pseudo-cyst. He observed similar diverticula in two other cases at the Vienna clinic; in one, the diagnosis was confirmed by Cæsarean section. The only explanation of the phenomenon seemed to be that before mentioned—an abnormal thinness of the uterine wall at one point, which was exaggerated during labor. The danger of rupture in such cases is, of course, great.

THE DECIDUA IN THE DIAGNOSIS OF EXTRA-UTERINE PREGNANCY.

AYERS (*Amer. Journ. of Obstetrics*, 1892, No. 3), from microscopical studies of the normal and diseased endometrium, reaches these conclusions: In cases of ectopic gestation the endometrium is usually transformed into decidua. This decidual tissue is pathognomonic of pregnancy. It may be removed with the curette for examination under the microscope, which, however, merely reveals the presence of the characteristic cells. The clinical history will then determine whether the condition is intra- or extra-uterine pregnancy.

TOTAL DISAPPEARANCE OF A FIBROID TUMOR AFTER APOSTOLI'S TREATMENT.

SKENE KEITH (*British Medical Journal*, July 9, 1892) reports the case of a lady, aged twenty-nine years, who had a uterine fibro-myoma, filling the pelvis and causing the most profuse menorrhagia with constant pain. She received thirty applications, the current having an average strength of eighty-eight milliampères, and each séance lasting five minutes. The symptoms were rapidly relieved and the tumor diminished in size. Six months later she was free from pain and the flow was nearly normal. She was examined a year after the suspension of treatment, when the uterus measured only two and a half inches in depth (instead of four inches, as at first), and no trace of a tumor could be found. A year later the cure was found to be permanent and the patient was without symptoms. The writer insists on the superiority of the electrical treatment to the removal of the adnexa, since

in both the cure is to be regarded as merely symptomatic, the disappearance of tumors of large size being a result which is not to be expected in either case.

RAPID DILATATION OF THE UTERUS IN CASES OF UTERINE HEMORRHAGE.

ROUTH (*Practitioner*, June and July, 1892) concludes a paper on this subject with this summary: In all cases of profuse menorrhagia the cavity of the uterus should be explored, rapid dilatation of the cervix under anæsthesia, by means of graduated bougies, being preferred, since the risk is practically *nil*. Even when tubal disease is present the operation is not contra-indicated, since the former is often secondary to, or aggravated by, endometritis. In cases of uterine fibro-myoma the immediate cause of the hemorrhage may be endometritis or polypus, which should be removed before proceeding to perform oöphorectomy or hysterectomy. Dilatation alone may relieve pain and hemorrhage. Preliminary dilatation and exploration of the uterine cavity should precede Apostoli's treatment.

THE TREATMENT OF URETERAL FISTULA.

KAMMERER (*N. Y. Medical Journal*, July 2, 1892) reports two cases of injury of the ureter during difficult abdominal operations, with resulting uretero-abdominal fistula. In both instances a subsequent nephrectomy was done with success. He discusses the proper course of immediate procedure in cases in which the surgeon recognizes the accident during the operation. If the injury is severe, and the patient's condition will admit it, he would perform nephrectomy at once; otherwise it would be better to transplant the proximal end of the ureter into the abdominal wound. As the latter procedure is not easy, he thinks that it might even be possible to compress the end of the ureter temporarily with forceps, shutting it off from the general cavity with gauze, and then removing the forceps after a day or two, when a uretero-abdominal fistula would be formed. Hegar and Müller are the only ones who have attempted to close the fistula by re-uniting the ureter with the bladder, with success in one instance.

THE FORMATION OF PERITONEAL ADHESIONS AFTER CÆLIOTOMY.

ODEBRECHT (*Centralblatt für Gynäkologie*, 1892, No. 34) reports the case of a patient upon whom he operated three times, the first time for retroflexion with fixation of the uterus and ovaries. Ventro-fixation was performed, but only the left ovary and tube were removed, as the right ovary was merely cystic; the cysts were punctured. The patient had a normal convalescence, but within a month after her discharge she began to complain of severe pain in the right ovary.

A second section was performed six months after the first. There were no intestinal adhesions or adhesions to the stump. The cysts in the right ovary had refilled; it was removed with the tube. Convalescence normal as before, but the patient soon began to complain of pain again, which was

localized at the upper end of the cicatrix, and was accompanied by excessive gastric irritability. A month later the abdomen was opened for the third time, and it was found that the omentum was slightly adherent to the anterior abdominal wall, so as to cause traction upon the stomach. Nothing else abnormal could be discovered. A perfect cure followed, the patient was up at the end of the second week, and was free from pain and gastric symptoms. The writer believes that omental adhesions may give rise to marked disturbance of the stomach, by limiting its peristaltic movements. On the other hand, the cause of persistent pain in cases of abdominal section is often obscure. By suturing the peritoneum separately one often prevents adhesions to the wound. These are also less likely to occur when antiseptics are entirely dispensed with.

[We have reported a case in which a third cœliotomy failed to cure the patient, the adhesions re-forming each time in spite of the greatest precautions. In addition to persistent pain, she had more or less constant metrorrhagia, although the absence of both ovaries and tubes was verified at the second and third operations. This patient eventually died of acute intestinal obstruction, due, doubtless, to the adhesion of a loop of gut to the cicatrix. A fourth operation was refused.—H. C. C.]

CONSERVATIVE CÆLIOTOMY.

SLAVIANSKY (*Centralblatt für Gynäkologie*, 1892, No. 35) would limit castration to those cases in which the ovaries are so diseased that the restoration of their functions is impossible; otherwise they are to be left undisturbed, or only the diseased portions excised. In cases of cystic degeneration he would not remove the ovary unless one or more of the cysts was suppurating, which could be determined by incision of the gland. The larger cysts can be punctured and the remaining portion sutured with catgut. Oöphorrhaphy may be employed in cases of prolapse. If it is patent, the contents of a diseased tube may be squeezed out and the tube may be catheterized and cleansed. It is often sufficient to separate adhesions around the adnexa.

RUDIMENTARY DEVELOPMENT OF MÜLLER'S DUCTS.

GLAESER (*Centralblatt für Gynäkologie*, 1892, No. 33) reviews the different methods of operative procedure in cases of retention of menstrual blood due to absence of the vagina. He agrees with Leopold that each case must be treated according to the special indications. Cœliotomy should be performed in doubtful cases where there are evidences of ovarian and tubal trouble. If hæmatosalpinx is certainly recognized, abdominal section should be done before an incision is made from below; but if a collection of blood is present in the rudimentary vagina, it may be at once slowly evacuated. If enlarged tubes remain after the uterus and vagina have been emptied, cœliotomy should be done at once.

DISEASES OF THE LARYNX AND CONTIGUOUS STRUCTURES.

UNDER THE CHARGE OF

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RHINOLITH.

An interesting example is related by DR. RICHARD WAGNER (*Münch. med. Wochenschr.*, No. 48). The first symptoms were observed in the second year of the patient's life, but it was not removed until twelve years later. It was found completely wedged in the posterior portion of the right upper jaw, where it had formed an almost cubical cavity without encroaching on the patency of the nasal passage. The offending body was too large to be removed anteriorly, and was withdrawn through the posterior outlet.

ABSCESS OF THE MAXILLARY SINUS.

DR. DUNDAS GRANT favors (*Journ. Lar. and Rhin.*, No. 12) exploratory puncture through the inferior meatus with a straight trocar and steel canula three inches in length and a millimeter and a half in diameter, its proximal extremity funnel-shaped to receive the nozzle of an ordinary syringe after withdrawal of the trocar, for the purpose of washing the sinus with a warm, clear, aseptic solution, usually of borax and boric acid.

MYXOMA OF THE SPHENOIDAL SINUS.

A small myxomatous polyp was found in a large sinus in a sphenoidal bone of a lad thirteen years of age, who had had fracture of the frontal bone two or three months before death, and who died during an epistaxis. The sphenoidal sinus was full of clotted blood, and communicated directly with an opening in the left carotid artery, which had probably been caused at the time of the accident. The case was reported by J. JACKSON CLARK to the Pathological Society of London, December 1, 1891, and Dr. Spicer remarked that he knew of but one other instance of the sphenoidal sinus, a case recorded by Zuckerkandl (*Journ. Lar. and Rhin.*, 1892, No. 2).

SPECIFIC DISEASE OF TONSILS AND PALATINE FOLDS.

In a paper (*Internat. klin. Rundschau*, No. 44) on clinical and histological changes in syphilitic tonsils and palatine folds, PROF. NEUMANN, of Vienna, expresses the opinion that the predilection of tertiary syphilis to be manifested in the same region in which the earlier lesions were manifested is due to the fact that the initial cure was only apparent and that residual portions of the infectious material have remained latent in the mouths of the ducts of the various glands, and even in the interstices between the epithelial cells.

The adhesions of soft palate, palatine folds, and uvula to the pharynx, usually attributed to contact of granulating surfaces, is attributed by Neumann rather to specific disease of the muscular apparatus of these structures, which prevents the movements which would loosen adhering granulations of the opposing surfaces. The movement of intact musculature is sometimes sufficient to tear off an adherent uvula from the palate. Histologically, too, the characteristics of specific myositis are very evident.

HEMORRHAGE AFTER AMYGDALOTOMY.

DR. BUISSET, of Brussels, contends (*Rev. de Lar., d' Otol., etc.*, No. 22) that hemorrhage a few hours after the operation is favored by the previous application of cocaine, which he attributes to vascular dilatation succeeding the immediate constriction produced by the topical use of the drug.

MORBID GROWTHS OF THE LARYNX.

PROF. CHIARI exhibited to the German Society of Naturalists and Physicians (*Internat. klin. Rundschau*, No. 41) two cysts of the vocal bands, one of which, the size of a bean, was attributed to an enlarged lymph space, and the other, the size of a millet-seed, was attributed to some undetermined softening process in the connective tissue. Microscopic cysts or such conditions as readily lead to cystic formations had been detected by Chiari in fifteen extirpated fibromas of the vocal bands. In none of the seventeen instances were there any glands or remnants of glands. Strong differentiation between actual cysts and cystic formations in morbid growths was not sustainable with the knowledge that a small cyst in a growth might gradually become so large as to constitute the main mass of the tumor, and then appear as a special growth, as in the larger cyst exhibited, which had developed from a fibroma.

ADENOMA OF THE LARYNX.

True adenoma of the larynx is rare. An example is recorded by SCHMIEGELOW, of Copenhagen (*Rev. de Lar., d' Otol., etc.*, No. 22) in a woman forty-six years of age and in apparently good health. She began to grow hoarse without assignable reason in July, 1887, but the hoarseness had never been excessive. There were no pain, dysphagia, hæmoptysis. December 15, 1887, DR. M. OLSEN detected a neoplasm on the right side of the larynx, in fragments of which he found a carcinomatous arrangement of the epithelial elements with partial colloid degeneration. On February 2, 1888, the patient was sent to Schmiegelow, who found the entire right ventricular band the seat of considerable irregular vegetation of a pale-red color and ulcerous-looking here and there. A small portion, the size of a common pea, near the anterior commissure was separated by a groove from the other portion of the neoplasm. On February 4th, after tracheotomy and laryngo-fissure, the perichondrium and the muscles of the right half of the thyroid cartilage were separated from it with blunt instruments, and the whole half of the thyroid cartilage, the arytenoid cartilage, and the greater portion of the inter-arytenoid fold were removed with curved scissors. Microscopic examina-

tion of the neoplasm showed it to be an adenoma. The patient did well and was dismissed on March 27th. She continued to do well until the summer of 1889, when she began to suffer with gastric disease attributed to carcinoma, and died cachectic on December 12, 1889, without any evidence of local recurrence in the larynx.

CARCINOMA OF THE LARYNX.

DR. L. LICHTWITZ, of Bordeaux, reports (*Annales des Mal. de l'Or., etc.*, No. 11) a case of carcinoma of the left vocal band removed by laryngofissure, with death five days later from hypostatic pneumonia. The interesting points of the record are the difficulties of the operation, which consumed more than three hours, owing to the difficulties in illuminating the parts and interruptions from suffocative paroxysms, due to penetration of blood into the bronchi despite the use of a tampon canula; and the reports of PROF. WALDEYER on the specimens submitted to him from fragments removed endolaryngeally, in which he regarded the sections as suspiciously but not positively carcinomatous, and expresses his opinion that benign papillary tumors may become carcinomatous. Several instructive engravings embellish the record.

CEREBRAL DISEASE AFTER SIMPLE OPERATION IN THE NOSE.

DR. WAGNER, of Halle, reports (*Münch. med. Wochenschr.*, No. 51), a case of fatal meningitis after electric cauterization of the lower and middle turbinates in a male twenty years of age. Severe hemorrhages occurred on the third day, requiring tamponing anteriorly and posteriorly. It did not appear to come from the wounded surfaces, the eschars upon which had not yet become detached. Fever supervened with intense headache in the frontal region, and more moderate in the occipital region. The tampons were removed at the end of sixty-three hours. The meningitis increased, and pains and stiffness occurred in the cervical muscles and in the right shoulder and arm, and steadily increased. Death ensued a week after removal of the tampon.

Wagner refers to a case of fatal meningitis after extraction of a polyp, reported by Voltolini, and to two cases reported by Quinlan (*Med. Record*, Sept. 13, 1890; *Journ. Resp. Organs*, June, 1890), and calls attention to the circumstance that the middle turbinate was involved in all the four instances. He attributes the hemorrhage in his own case to thrombosis of the longitudinal sinus, with consequent collateral stasis of the venous blood in the nasal passages, and metastatic transfer of some of its broken constituents in the upper extremity. The complications of meningitis are dependent upon the anatomical relations of the venous and lymph currents. The veins of the upper and middle turbinates empty into the longitudinal sinus through the foramen cæcum and the foramina of the cribriform plate of the ethmoid bone, and the lymph channels of the nose communicate directly with the subdural and subarachnoid spaces.

Hence infection is carried directly to the meninges by the latter path and to the longitudinal sinus by the former.

PÆDIATRICS.

UNDER THE CHARGE OF

LOUIS STARR, M.D.,

OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

OF PHILADELPHIA.

THE ETIOLOGY OF PRIMARY LARYNX-CROUP.

A contribution to the study of this subject is made in a recent paper by E. FRÄNKEL (*Deutsche medicinische Wochenschrift*, 1892, No. 24, p. 564), who firmly combats the view held by certain German writers, Henoch in particular, that primary croup of the larynx is not a diphtheritic affection, properly so-called, as it is not characterized by the presence of the Klebs-Löffler bacillus.

The author has had occasion to observe recently four cases of primary croup, in which autopsy showed the mucous membrane of the pharynx and tonsils perfectly intact; but a complete bacteriological examination of the false membrane, by staining, cultures, and experiments on animals, revealed the specific bacillus of diphtheria among other microorganisms.

CHRONIC HYDROCEPHALUS IN HEREDITARY SYPHILIS.

HELLER (*Deutsche medicinische Wochenschrift*, 1892, No. 26, p. 608) refers to the not infrequently noted connection between hereditary syphilis and hydrocephalus, and reports a case in an infant a few months old treated by iodide of potassium. Under the influence of this drug the dimensions of the head diminished, the intellectual development became normal, and, at the end of a year, with the exception of a somewhat enlarged cranium, the child differed in no respect from a healthy infant of that age. The author believes that in all these cases of hydrocephalus it is important to bear in mind the possibility of hereditary syphilis; and if this etiology is confirmed, active antisiphilitic treatment may produce most happy results.

ANOTHER TREATMENT FOR DIPHTHERIA.

WILHELMY (*Deutsche medicinische Wochenschrift*, 1892, No. 5, p. 99) describes a method of treatment which he has tried for twelve years with remarkable success. When adopted at the beginning of the illness, it is said to so influence the disease that it pursues its course very benignly.

The principle of the treatment consists in a thorough bathing of the throat with a solution of chloride of zinc of 20 per cent. strength. This solution has the power of penetrating quite deeply into the infected parts, but sparing those which are covered with healthy epithelium. For this purpose he uses an applicator curved at its extremity, around which is rolled absorbent cotton

to be soaked in the solution. The curve enables the operator to reach the posterior face of the tonsils, the uvula, and part of the naso-pharynx. A tongue-depressor is invariably required.

The pain is quite sharp, but does not last more than twenty minutes, and is quite efficaciously controlled by iced water or fragments of ice held in the mouth. In spite of this quite intense cauterization, it is said that no œdema has been observed. After the application, and on the following day, the author prescribes a gargle composed of 300 grammes of lime-water, 30 of glycerine, with a few drops of essence of peppermint; and a diet of wine and meat pulp is ordered. At the end of three to six days the eschars become detached and the underlying mucous membrane appears healthy.

RESULTS AFTER RESECTION OF RIB FOR CURE OF EMPYEMA.

E. B. HASTINGS and HARFORD N. EDWARDS (*Lancet*, August 20, 1892, p. 414) give a report of the present condition of 24 children upon whom this operation was performed at the East London Hospital for Children. In 2 cases, seven years had elapsed; four to five years in 4 cases; three to four years in 2 cases; two to three years in 7 cases; one to two years in 6 cases; and less than one year in 3 cases.

The etiology in most of the cases was doubtful, the patients having been brought to the hospital only when the disease had reached a more or less chronic stage; but it was stated to have been the result of pleuro-pneumonia in some of them, and it was probably a sequel of this disease in most cases.

At the time of examination the authors state that the healthy appearance of the children in most cases was very striking, especially when one considers the unfavorable hygienic surrounding of the class of population from which most of the patients were drawn. There was pain in the affected side in 2 cases, but only occasionally. In 8 there was a history of cough, but in only 1 was this said to be severe. Four of these 8 cases had slight bronchitis when examined, and another had granular pharyngitis, to which the cough was probably due. Two of the 8 were said also to suffer from shortness of breath. One child was stated to be wasting, but in her case the wound continued to discharge for nearly two years; she had had scarlatina during this time, and the physical signs suggested dilated bronchi.

Careful physical examination revealed a completeness of recovery in the majority of cases which was surprising. The general nutrition was good in 19 cases, and fair in 5. In the majority of cases inspection of the chest gave no indication of disease beyond the presence of the scar. The spine was straight in 19 cases, slightly curved in 3, and distinctly curved in the remaining 2. In 15 patients the shoulders were on the same level; in 7 the shoulder on the side on which the empyema had been was slightly lower, and in 2 this shoulder was distinctly lower. In no case was there marked flattening of the chest wall; in 16 there was no flattening, and in 8 only a slight degree of deformity. The resected portion of rib appeared to be replaced by bone in all the cases. No difference could be made out between the movements of the two sides in 14 cases; in 8 the expansion was slightly less on the diseased side, and in 2 cases this difference was distinct. The results of percussion were as follows: Complete absence of dulness was found in 8

cases; in 7 there was some dulness in the immediate neighborhood of the scar; in 5 there was slight dulness over a more extensive area; and in the remaining 4 there was distinct dulness. The breath sounds were unaltered in character and equal on the two sides in 10 cases; in 2 they were rather weaker in the situation of the scar; in 10 there was weakness of breath sounds over a considerable area of the diseased side as compared with the healthy side; and in the remaining 2 the breath sounds were distinctly weak on the affected side. The position of the heart's apex was, in the majority of cases, close to the left nipple line.

These results point to good recovery of the lung in nearly all the cases. The completeness of recovery is surprising when it is considered how seriously ill the child generally is before operation; how profuse is the discharge of pus after operation; and to what an extent the physical signs are altered, even after the wound has healed. When discharged from the hospital, deformity, impaired movement of the chest, dulness, and weakness of breath sounds are generally quite distinct.

THE GALVANO-CAUSTIC TREATMENT OF DIPHTHERIA.

BLOEBAUM (*Deutsche Medizinal-Zeitung*, 1892, No. 1, p. 1) believes that diphtheria is a bacterial affection, primarily local, and that an antiseptic treatment, at once efficient and yet harmless to the patient, is the great desideratum. Imitating the practice of ophthalmologists in the use of the galvano-cautery as an alterative and disinfectant in grave infectious conditions of the eye, he has experimented with this instrument upon diphtheritic inflammations since 1885, at first upon pigeons and later upon human patients. He states that this agent is a concentrated antiseptic whose destructive action can be strictly limited to the affected parts, killing the microbes and destroying the focus of infection. It does not excite inflammation, but rather encourages regenerative processes. When the loop of the cautery is brought in contact with the affected spot, the false membrane is consumed and removed with the withdrawal of the instrument, while the astringent action of the heat checks all hemorrhage. After the cauterization an insufflation of dermatol is given. The temperature begins to fall three hours after the operation, and at the end of twenty-four hours has become normal, while the swelling of the infiltrated mucous membrane quickly diminishes and cure is rapidly established. This treatment, to the exclusion of all others, has been employed by the author in forty cases of well-marked diphtheria, without a single death. Cure has resulted in a period of from one to five days, the average duration being three days.

CHOREA IN THE NEGRO.

DR. PHILIP S. ROY, of Washington (*Medical Record*, 1892, vol. xlii., No. 8, p. 215), calls attention to the fact that not only Hammond, in his work on *Nervous Diseases*, but also Mitchell, and, after him, Allan McLane Hamilton, state that chorea is unknown in the negro. The author recalls that he himself was among the first to refute this statement four years ago; and he now is able to report a very marked case of the disease in a full-blooded negro child, seven years of age.

APPENDICITIS IN CHILDREN.

Four cases are reported in an interesting paper by PÉRRET (*Lyon Médical*, 1892, tome lxx., No. 26, p. 279). The first two occurred in girls of eleven and a half and twelve and a half years respectively, and both recovered under a purely expectant treatment. The third and fourth cases, both fatal, are particularly valuable because of the autopsies, which, taken in conjunction with the physical signs observed before death, shed some light on the question of surgical intervention.

Of these two cases the first concerned a girl aged six years, sick about ten days before coming under observation, with general malaise, pain in the abdomen, headache, diarrhœa for the preceding two days, but no vomiting. The belly was uniformly swollen and painful, with some increased tenderness in the right hypochondrium. No fluctuation or dulness could be made out. Stools were frequent, liquid, of a yellowish color, mixed with some clear glairy mucus, but no blood; tenesmus. Pulse very small, temperature $104\frac{3}{4}^{\circ}$. The next day sudden vomiting came on, and death supervened in three hours. On opening the abdomen the peritoneum and intestines were found injected, with numerous patches of false membrane between the coils; quite a quantity of blood-stained effusion and free pus in the true pelvis, and upon its sides. The appendix, of the size of the little finger, was found extending upward and behind the cæcum, to which, however, it was not adherent. There was no perforation or ulceration, but its lumen was dilated, and at its terminal portion contained healthy pus.

The other case occurred in a girl of seven years. The history showed that a year before she had had a fall upon the right side followed by severe pain in the right iliac fossa. A second attack of pain in this location, with constipation and several attacks of vomiting, had occurred two months before the last illness, and had lasted two or three days. Four days before observation, without appreciable cause, she had been seized with sudden and violent pain in the same position as before, with repeated vomiting and absolute constipation, attended by extreme general abdominal tenderness, especially marked in the right iliac fossa, but without any appreciable dulness or fluctuation under the most careful and repeated examination. In this case the continued aggravation of the symptoms led to surgical intervention, and several incisions were made, free pus being obtained from a median incision. The appendix was removed and proved to be reddened and swollen, and showed a perforation. The true pelvis also contained pus, which was partly evacuated by a counter-opening through the vagina. The child died of exhaustion several days later, and the autopsy showed a small pocket between the omentum and transverse colon which had escaped the knife.

These four cases of appendicitis permit of division into two distinct classes: the first two being acute, with a circumscribed peritonitis; the last two, also acute, with a more or less immediately generalized peritonitis.

These last two cases prove most conclusively that the absence of dulness to be demonstrated in cases of general peritonitis does not disprove the presence of liquid or purulent effusion, and is, therefore, not a contra-indication to operation, for the pus may be more or less diffused in patches, or collected in small foci imprisoned by recent adhesences, or accumulated in the pelvis,

and thus escape detection by the most careful examination. Added to this is the fact that in the case of children Tripiér's sign can scarcely be evoked as a help in doubtful cases.

These observations, therefore, show that it is necessary to establish a clear distinction between appendicitis with circumscribed peritonitis and appendicitis with peritonitis at once or rapidly generalized. In the former cases the author advises a purely medical treatment, with careful watching, being ready to operate if any accident occur, or when general or local signs render very probable the existence of a focus of suppuration. In the other cases he thinks that it is necessary to operate at once without being deterred by the apparent absence of effusion. The incision should be large, and, if necessary, several incisions should be made, so that no concealed focus of suppuration may escape.

TREATMENT OF TUBERCULAR RETRO-PHARYNGEAL ABSCESS.

KRAMER (*Centralblatt f. Chirurgie*, 1892, No. 12, p. 233) advances the proposition that a tubercular retro-pharyngeal abscess (cervical spondylitis) should not be opened by the mouth, as this prevents any rational treatment of the diseased bone. Such abscesses he thinks should be opened externally, either by the method of Chiene (incision along the posterior border of the sterno-mastoid, beginning at the mastoid apophysis), or by that of Burkhardt, by an incision along the inner border of the sterno-mastoid, where the vertebral column can be reached between the larynx and the inner side of the thyroid vessels and the primitive carotid. In this way such an abscess can be treated as any other tubercular abscess: scraping of its wall, and of the bone itself, if necessary, and tamponing with iodoform gauze.

Burkhardt's method was chosen by the author in treating a case of abscess originating in a tubercular spondylitis of the third and fourth cervical vertebræ in a little girl of four and a half years, who had previously presented other manifestations of osseous tuberculosis. The operation was easy, and the hemorrhage so slight that not a single vessel needed ligation. Cure was effected in three weeks.

CORRIGENDUM.—On page 432 (1st line, 2d paragraph), of the October JOURNAL, in Dr. D. D. Stewart's paper, "Treatment of Aneurism," for "2½ inches" read "2½ feet."

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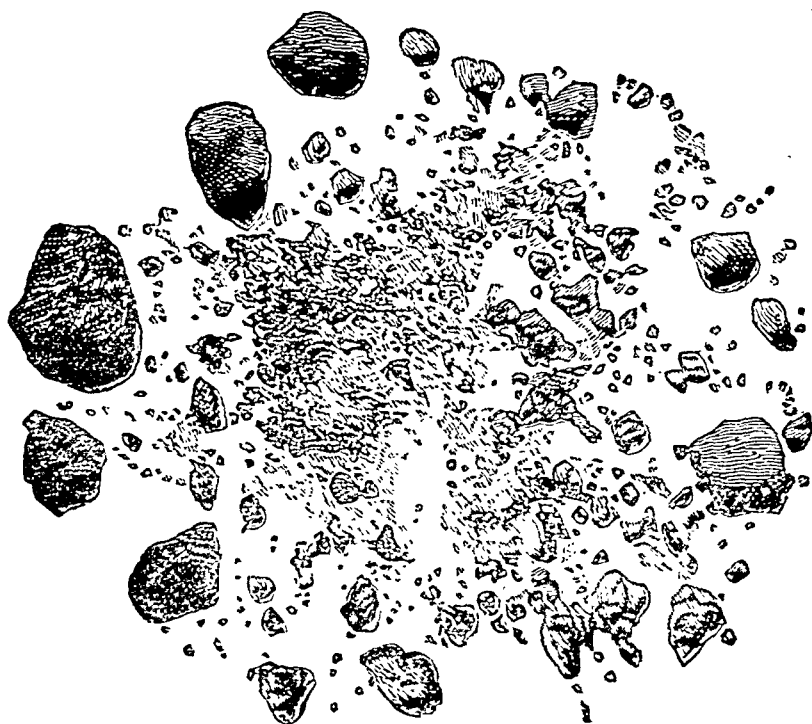
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after same operation a few years previously, he was afraid and refused to consent. In view to palliate, I ordered him to drink one quart of Buffalo Lithia Water every day. Washing out the bladder once a day with the same, warm, a careful attention to diet and bowels, with gentle tonics. This treatment was faithfully kept up for nine months, when pus appeared in the urine and the operation could no longer be

delayed. During the time he was under the treatment, large quantities of débris came away, some of the pieces were so large that it was only by great effort that they were passed via urethra. None of these were saved. The day before the operation, on the twentieth day of June, I examined him again, and the stone did not seem so large nor was the click so pronounced, though we could tell that there was a stone present by the grating as from a rough body. On the twenty-first, I did the left lateral operation, and after getting into the bladder, I introduced the forceps, grasped the stone and pulling it away I found it was like a mass of putty filled with sand. It was sacculated and there was a quantity of pus in the viscus. With forceps, gouge, curette and fingers I finally got it all away. No part of it was so hard but that it could not be crushed with very little effort between the fingers. After the fragments were allowed to dry they became hard.

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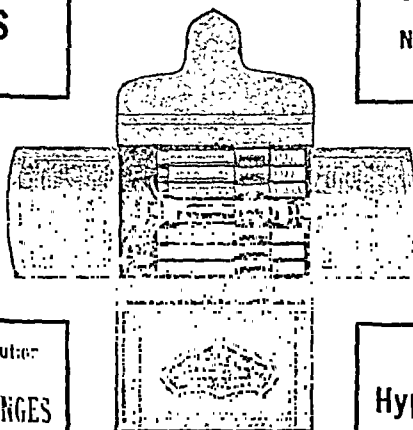
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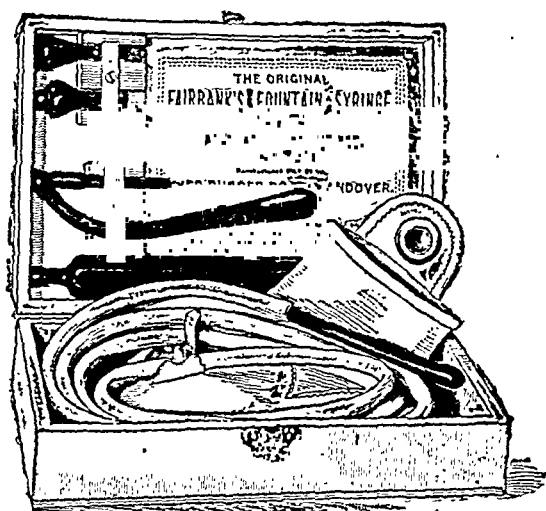
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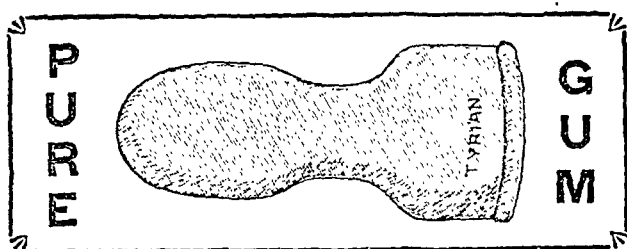
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CONTENTS.

ORIGINAL COMMUNICATIONS.

	PAGE
Traumatic Nervous Affections. An Attempt at their Classification based on a Study of Ninety Cases. By PHILIP COOMBS KNAFF, M.A., M.D.	629
On the Differentiating Action of Alcohol in the Nervous System; with Observations on its Toxic Symptoms. By ALEXANDER ROBERTSON, M.D., F.F.P. and S.G.	643
Angio-neurotic Œdema. A Contribution and Critical Study. By JOSEPH COLLINS, M.D.	654
Suture of the Patella after Fracture. By ROSWELL PARK, A.M., M.D.	681
Inhalation of Dust and Pulmonary Disease. By WILLIAM BUCKINGHAM CANFIELD, A.M., M.D.	686
Cortical Epilepsy—Operation; Recovery. By ALEXANDER B. SHAW, M.D.	691
Retro-peritoneal Tuberculosis, Simulating Hernia. By EDWARD P. DAVIS, A.M., M.D.	695
A Case of Plica. By HENRY W. STELWAGON, M.D.	700

REVIEWS.

The Diseases of the Stomach. By C. A. Ewald, M.D.; translated by Morris Manges, A.M., M.D.	702
The Ready-reference Handbook of Diseases of the Skin. By George Thomas Jackson, M.D.	704
Human Monstrosities. By Barton Cooke Hirst, M.D., and George A. Piersol, M.D.	705
Practical Midwifery: A Handbook of Treatment. By Edward Reynolds, M.D.	705
First Lines in Midwifery. By G. Ernest Herman	705
The Students' Quiz Series. Obstetrics. By Charles W. Hayt, M.D.	705
A Manual of Obstetrics. By A. F. A. King, A.M., M.D.	705
"Characteristics." By S. Weir Mitchell, M.D., LL.D.	707
Treatise on Gynecology, Medical and Surgical. By S. Pozzi, M.D. Translated from the French by Brooks H. Wells, M.D.	709
A System of Gynecology. [Pozzi's.] Revised by Curtis M. Beebe, M.D.	709
Surgical Diseases of the Ovaries and Fallopian Tubes, including Tubal Pregnancy. By J. Bland Sutton, F.R.C.S.	709
Diseases of Women: A Manual of Non-surgical Gynecology. By F. H. Davenport, M.D.	709
Materialism and Modern Physiology of the Nervous System. By William H. Thomson, M.D., LL.D.	710

PROGRESS OF MEDICAL SCIENCE.

THERAPEUTICS.

	PAGE		PAGE
Treatment of Cholera by Chloroform	711	Treatment by Electrical Energy	713
Sulphate of Soda in Acute Dysentery	711	Hydrogen Peroxide in Diphtheria	713
The Anti-emetic Action of Menthol	712	Iodoformed Turpentine Inhalations	714
Menthol in Vomiting of Pregnancy	712	The Monochloride of Phenol	714
Diet and treatment of Bright's Disease	712	Treatment of Pneumonias of Diabetics	715

	PAGE		PAGE
Hypophosphite Preparations . . .	715	Günzberg's Test in Chronic Dyspepsia	716
Infectious Broncho-pneumonia . . .	716	Succinimide of Mercury in Syphilis .	717
Resistance of the Bacillus of Influenza		Treatment of Dyspnœa	717
to Physical and Chemical Agents . .	716	Sterilization of Water during Cholera	718

MEDICINE.

Tuberculoma of Cerebral Peduncles .	719	Immunity to Cholera	722
A Peculiar Form of Nystagmus . . .	720	Critical Pulmonary Œdema in the	
Infusoria in the Sputum of Pulmonary		Course of Croupous Pneumonia . .	722
Gangrene	720	Endocarditis after Gonorrhœa . . .	722
Erythromelalgia	721	Suppurative Pyle-phlebitis	723
Ammonia in the Gastric Juice	722	Development of Bacteria at 32° F. .	723

SURGERY.

Supra-pubic Cystotomy through the		Resections of the Superior and Infe-	
Right Rectus Muscle	724	rior Maxillæ	726
Pyoktanin as an Antiseptic	724	Surgery of the Gall-bladder	727
Drainage in Psoitis and Pelvic Abscess	725	Fracture (Dislocation) of Spine . .	727
Treatment of Tubercular Joint Disease	725	Implantation of Ureters into Rectum	728
Surgical Treatment of General Puru-		Malignant Goitre Treated by Excision	729
lent Peritonitis	726	Sarcoma of the Tonsils	729

OTOLOGY.

Chronic Non-suppurative Inflamma-		Operative Exposure of the Middle-	
tion of the Middle Ear	730	ear Cavities after Detachment of	
Operative Removal of Foreign Bodies		the Auricle	731
from the Tympanic Cavity	731	Cholesteatoma of the Middle Ear . .	732

OBSTETRICS.

Hæmoglobin in the Blood of the		Ectopic Pregnancy	735
Newborn Child	733	Tubal Gestation in Both Tubes . . .	736
Recent Experiences in Cæsarean Section	733	Literature on Ectopic Gestation . . .	737

GYNECOLOGY.

Myoma of the Fallopian Tube	738	Cœliotomy by the Transverse Incision	740
Primary Carcinoma of Corpus Uteri .	738	Castration for Relief of Menorrhagia	
Rectal Gonorrhœa	739	due to Uterine Fibroids	740
Resection of the Uterus in Cases of		Gonorrhœal Peritonitis in the Female	741
Pelvic Suppuration	739	Ascites in the Female	741
Tubo-ovarian Cysts	739	A New Method of Shortening the	
The Etiology of Prolapsus	739	Round Ligaments	742

PÆDIATRICS.

A Clinical and Bacteriological Study		The Resorptive Power of the Stomach	
of Diphtheria	742	in Young Children	745
Lymphangitis of the Breast and its		Peliosis Rheumatica	745
Danger to the Nursling	744	Hypersecretion of Saliva after Mumps	746

THE
AMERICAN JOURNAL
OF THE MEDICAL SCIENCES.

DECEMBER, 1892.

TRAUMATIC NERVOUS AFFECTIONS.¹

AN ATTEMPT AT THEIR CLASSIFICATION BASED ON A STUDY OF
NINETY CASES.

BY PHILIP COOMBS KNAPP, A.M., M.D.,

CLINICAL INSTRUCTOR IN DISEASES OF THE NERVOUS SYSTEM, HARVARD MEDICAL SCHOOL;
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BOSTON CITY HOSPITAL.

AMONG the sources of confusion in regard to traumatic nervous affections we must certainly recognize the mistakes in nomenclature. Twenty years ago everything was called "spinal concussion," until gradually it was shown that the spine was often unaffected, and, when it was, it was seldom "concussed;" but even now some writers apparently think that if they have proven that spinal concussion does not or cannot exist, it follows that there is no disease of any sort. Later on, the natural process of differentiation began. Page argued that in many cases the trouble was merely traumatic lumbago with neurasthenia. Charcot and his pupils demonstrated the hysterical nature of the affection in some cases. Westphal and his pupils held that in some cases there was a distinct organic basis. There was still much dispute, and each view had its partisans, the French especially taking the extreme view that everything was hysteria.

At that time the monographs of Oppenheim and Strümpell brought the term "traumatic neurosis" into prominence. The term naturally

¹ Read before the American Neurological Association, June 23, 1892.
vol. 164, no. 6,—PICHETTE, 1892.

suggested itself for a title to the paper¹ which I read before this Association four years ago, but, as I believed that a part of the cases were due to organic nervous disease, I rejected it, holding that neurosis meant a functional nervous disease, and resorted instead, both then and now, to a longer but more comprehensive title. Unfortunately many writers have tried to give the general term a specific character, and it has become a drag-net, including everything, even cases which have shown *post-mortem* definite organic changes. Men speak of "the traumatic neurosis" as definitely as they do of tabes or brain tumor, and confusion and controversy have been doubled. On the other side the French, although tacitly admitting the existence of traumatic neurasthenia, maintain that there is no traumatic neurosis but only traumatic hysteria, and, blind to clinical records and autopsies, they deny that cases exist with an organic basis. Osler,² almost alone of recent writers, recognizes the three classes of cases, to which I also called attention in the paper just cited, namely, neurasthenia, hysteria, and cases with an organic basis.

It has seemed to me that it is time to call attention once again to the different forms of traumatic nervous disease, to cease the premature generalizing, and to return to the wiser method of differentiating the various affections which have been improperly classed under one heading. We cannot admit one single affection, whether we call it hysteria, the traumatic neurosis, Erichsen's disease, neurasthenia, traumatic lumbago, or spinal concussion. Traumatic neuroses, as we shall see, exist, but "traumatic neurosis" is nearly as vague as neurosis by itself, and it should be left to those men who are satisfied with a diagnosis of "insanity," "womb trouble," or "liver complaint." Unfortunately much is still obscure, and our divisions cannot be made with precision. We cannot lay down hard-and-fast rules for differential diagnosis, or put every case into its proper pigeon-hole, but we can make a more scientific classification of cases than to call them all traumatic neurosis with the Germans, or traumatic hysteria with the French.

I have therefore attempted to classify ninety consecutive cases that have come under my own observation, excluding cases of traumatic insanity and traumatic epilepsy, rather than to review the more recent literature and classify the cases that have been reported there. Imperfect and hurried observations may have rendered some of my notes unsatisfactory, and cases exist where the diagnosis was doubtful and where the propriety of the classification might be questioned, but they afford, I believe, indications for a more complete classification, and distinguish, perhaps with too vague an outline, some of the different forms of the traumatic nervous affections. In forty-two cases there was no question of litigation, and in two others the litigation was over;

¹ "Nervous Affections Following Injury." Boston Med. and Surg. Journal, November, 1888.

² Practice of Medicine, p. 981 et seq.

several more consulted me for treatment, not for an opinion to be used in the settlement of their claims. Hence the opportunity, from the contrast between the two sets of cases, for the study of special "litigation symptoms" should be a good one.

Before discussing the various affections of the central nervous system it is necessary to speak of certain groups of symptoms which have been much discussed. They often are severe in type, and, causing much distress, they occupy a prominent place in the clinical picture. I refer to those disturbances in the back which are so common and so dominant that they were formerly referred to a lesion of the cord itself, and still give color to the term of spinal concussion or railway spine. Fifty-six patients complained of pain in the back, usually associated with tenderness, rigidity, and increased pain on motion. In only nine, however, was the trouble in the back the chief difficulty. In the other cases it was merely a complication and was associated with other conditions.

Eight of these nine cases were cases of traumatic lumbago or railway back, which has been so fully described by Page¹ and Dercum² as to need no extensive discussion here. The trauma causes a twisting or wrenching of the muscular fibres, especially of the fibres in the muscular masses in the lumbar region, the muscles being larger and less protected, and the vertebral column itself being more movable in this region. With this may be, and probably often is, associated a wrenching and tearing of the fibres of the fasciæ and ligaments. These lesions give rise to the well-known symptoms: pain in the back, increased on motion; reflex spasm of the spinal muscles from the pain, leading to rigidity of the vertebral column; an increase of pain on transmitted shock; marked tenderness of the muscles about the vertebral column. With this wrenching of the vertebral column and its protecting soft parts, it is not improbable that the spinal peripheral nerves in that region also suffer. In my previous paper on this subject, already referred to, I called attention to the occasional association of peripheral neuritis in these cases; and in two of these eight cases there was also neuritis, one of the sciatic nerve, the other, where the injury was high up, in the nerves of the arm. Neuritis added further complications to some of the other cases in the present series, but, as its symptoms are usually so plain, I need dwell no further on it. In six of the eight cases there were more remote symptoms—weakness in the legs, numb and prickly feelings in the legs, some difficulty in passing water, a diminution or temporary absence of sexual power, and exaggerated knee-jerks. Page³ maintains that the pain in the back may interfere with locomotion and with the

¹ Injuries of the Spine and Spinal Cord. Railway Injuries.

² THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES, 1891.

³ Railway Injuries, p. 12 et seq.

movements of expulsion, and thus produce all these symptoms. This explanation is perhaps correct, but I do not believe that we can speak quite so positively as Page is inclined to. He fails to consider the possibility of peripheral nerve lesions, and it certainly is far more possible than he is willing to admit, that injury may produce slight changes in the cord itself capable of giving rise to these symptoms.

In one case the pain in the back was clearly not due to a traumatic lumbago. There was less reflex rigidity, the pain was more acute and followed the distribution of the nerves, and hyperæsthetic points were discovered. In other words, we had to do with a traumatic ilio-inguinal neuralgia (neuritis?)—a rare result of injury, yet one which should be borne in mind.

There is another condition which may give rise to pain in the back to which much less attention has been paid, but which is of equal if not of greater importance than traumatic lumbago: it is the condition of so-called spinal irritation, so common in neurasthenic states. In many cases the back itself has received only a slight injury, or, perhaps, none at all. Nevertheless, the patient complains greatly of pain in the back, which is often much more acute and more severe than the pain of traumatic lumbago. The chief seat of the pain is usually in the lumbar region, but there is another region, nearly if not quite as painful, in the upper dorsal or lower cervical region, and from these points the pain shoots up or down, and is often referred to that favorite seat of neurasthenic disturbances—the base of the brain. Other disagreeable sensations may accompany the pain—a feeling as if the vertebræ were being pulled apart; as if a hot iron or ice was being passed up or down the spine; as if a stream of water were flowing down the spine, and many similar sensations. The movements of the vertebral column are usually somewhat impaired, for they are apt to increase the pain, but the reflex rigidity of the spinal muscles is less marked, and the pain on transmitted shock is not as great as in traumatic lumbago. Tenderness is most marked in the two regions mentioned; it involves the muscles, but it is also pronounced over the spinous processes of the vertebræ, and it may be more superficial and greater to a slight touch than to deep pressure. It is usually greater than in traumatic lumbago. As this condition of spinal irritation may coexist with a slight traumatic lumbago the distinction between them is not always easy. Spinal irritation, however, does not exist as an independent traumatic affection. It is merely a complication of neurasthenic conditions, and is really so familiar that it is hardly necessary to dwell upon it here, were it not for the fact that recent writers have practically ignored it.

Before leaving the subject of pain in the back I would speak once more of the importance of the test first proposed by Rumpf.¹ If pressure be

¹ Centralbl. f. Nervenheilk., June 15, 1889.

applied over a tender spot the pain thus produced will cause an acceleration of the pulse of from five to twenty-five beats a minute. In a few cases, where the patient's general condition was poor and circulatory symptoms were present, I have noted also a weakening of the pulse. In a few cases where the patients had previously described the tenderness as slight I have failed to get this acceleration, but in all cases where the tenderness was pronounced I have succeeded in demonstrating it.

It will be considered heretical, at the present day, to begin a consideration of traumatic nervous affections by speaking of traumatic affections of the spinal cord. It has been proven most conclusively, on *a priori* reasoning, by Page, Watson,¹ and others, that in these traumatic cases the spinal cord is exempt. Of course, there are cases of acute paraplegia or local paralysis and anæsthesia which point directly to a transverse or a more limited focal lesion in the cord, or perhaps to a lesion of the nerve roots. Here there can be a question only of the nature of the morbid process. We have to do either with a fracture or dislocation of the vertebræ, with a consequent crushing of the cord, with spinal hemorrhage, or with acute softening, which may be due to an injury which has not caused any lesion of the vertebral canal. In such cases the symptoms are sufficiently clear to render a decision easy, and I need dwell no further upon them. Five cases belonged to this class, but the relative proportion of cases is too small, for during this period I have seen several cases in the hospital with my surgical colleagues, of which, unfortunately, I have kept no record.

Notwithstanding the weighty arguments that have been brought forward to prove that, apart from the class of cases just mentioned, the spinal cord is exempt from injury, there are some cases which point strongly to some affection of the spinal cord. The injury may be directly over the vertebral column, or it may be remote—a jar from falling on the feet or the buttocks, or even the jar from a blow on the flank. After such an injury the symptoms develop gradually and insidiously. The chief complaint is of weakness and stiffness in the legs and of pain in the back, the latter being often due to traumatic lumbago. The knee-jerks are somewhat exaggerated, and sometimes there is ankle clonus. One or both legs may show some muscular atrophy, usually without electrical changes. There is often some pain in the legs and various perversions of sensibility, but anæsthesia is rather rare. Disturbances of micturition are not uncommon; the demand is often imperative, and, if it be not immediately gratified, there may be a little incontinence; sometimes, too, it is hard to start the stream, or it stops before the bladder is fully emptied. Constipation is common, and sometimes the anal sphincter, in moments of imperative need, yields involuntarily. In these cases the clinical picture resembles somewhat that of

¹ Watson: An Experimental Study of Lesions Arising from Severe Concussion.

spastic paralysis, and autopsies and experiments on animals have shown the most marked changes in the lateral columns. Cerebral symptoms are absent and everything points to a spinal origin. Four such cases have come under my observation, and in only one was there any question of litigation. I intend later to examine critically the arguments of those who deny the possibility of the existence of such cases, and to make a more elaborate study of the subject. As the term spinal concussion still persists in medical nomenclature, it might be well to restrict it to cases of this type, even though etymologically it has no better justification for its existence than has hysteria.

I must also mention those rare cases where definite systemic disease of the spinal cord is due to injury. In the ninety cases of this series only one such case has occurred, a case of progressive spinal muscular atrophy which I have already reported in full.¹ Of course, whether the systemic disease be tabes or progressive muscular atrophy—the two chief systemic affections—the chief question is not as to diagnosis, but as to whether the symptoms of the disease may not have preceded the trauma, as I have more than once found to be the case.

In another rather large class of cases the symptoms may be as definitely referred to some cerebral disturbance. Here the trauma has affected the head, and general concussion of the body has usually been absent. I have put thirteen cases of the series into this class, but the relative proportion is too small, for again, unfortunately, I have failed to keep records of all the cases that I have seen in consultation in the surgical wards. Clear cases of fracture or hemorrhage have been omitted. In these cases, after direct injury to the head, there has been persistent headache and vertigo, usually attended with a diminished power of application and sometimes with some failure in the mental processes. Mental irritability has also been a not infrequent symptom. Deafness and tinnitus aurium have been occasionally observed. With the headache the skull is often tender to pressure or percussion. Insomnia is not unusual. Indications of any focal lesion in the brain, except localized headache and tenderness, have been wanting. The condition is at times temporary, but more often it is very chronic in its character. The pathological processes underlying it are probably very various: hemorrhagic pachymeningitis, slight meningeal hemorrhage, chronic lepto-meningitis, slight fractures of the skull, may all give rise to the trouble. Of course, in many cases of head injury other symptoms develop, such as partial epilepsy, paralysis, affections of the cranial nerves, etc., which indicate a localized lesion and render a diagnosis possible. There are, however, many cases which present only the few symptoms

¹ "Hereditary and Traumatic Motor Tabes," Boston Medical and Surgical Journal, October 1, 1891.

mentioned above, where we have no means of making an exact pathological diagnosis from the scanty data before us. Nevertheless the symptoms may occasion much suffering, the condition may become chronic, and our therapeutic resources may be of little avail. It is only rarely, unless there be distinct focal symptoms, that we can determine the underlying pathological changes, but I am inclined to think that, in a part of the cases at least, there are definite lesions of some sort. By an analogy with the previous class of cases we might speak of these as cases of chronic cerebral concussion.

In a very few cases of traumatic nervous disease which have come to autopsy, diffuse chronic changes, in the nature of sclerosis, have been found in the central nervous system. In spite of these autopsies and certain corroborative clinical evidence, many writers hesitate to admit that there is a form of traumatic nervous disease of insidious onset and chronic course, which terminates fatally and is due to organic disease. Two authorities on the subject have said to me, when I had spoken of the fatal termination of certain cases, "They must have had some other trouble; they could not have died of any traumatic neurosis." Even Osler, admitting the possibility of this form, states that he has never seen a case where the clinical symptoms pointed to organic disease.¹ My own experience, however, has led me to regard this as one of the commoner forms of traumatic disease. Unfortunately I cannot adduce the testimony of any new autopsies, and I am ready to admit that a fatal termination is not proof of organic disease. The old distinction between organic and functional, however, cannot be strictly maintained. We know that effort and fatigue may produce demonstrable changes in the nerve cell. If, therefore, morbid symptoms have existed for several years, and if these symptoms have gradually increased to a point where they have caused death, it is fair to suppose that the changes in the nervous system which have produced these symptoms are of a fixed and visible type, more nearly approaching the "organic" lesions in the old sense of the term.

Four of the cases in the present series have resulted fatally to my knowledge. In other cases which have now passed from my observation such a termination is, of course, possible. Two of these cases (Cases VII. and XI. of the paper already cited) have already been reported to this Association. The prominent symptoms in these cases were pain in the head and back and vertigo; there was a failure of the power of mental application and of the memory, with increased nervousness and irritability and insomnia. The pulse was usually rather quick and weak, and the patients complained of palpitation and shortness of breath. The appetite and digestion were poor, vomiting occasionally

¹ Op. cit., p. 984.

occurred, and the bowels were usually constipated. There was usually some difficulty in passing water, and in two cases there was incontinence. The movements were slow and weak, and in two instances there was partial hemiplegia; in two cases also there was tremor which was more marked on motion. There was in most of the cases pretty well marked anæsthesia, of rather general distribution, but more marked in the legs than in the arms. The knee-jerks were never above the normal, and in one case they were absent. In only one case, which was thought to be hysterical amblyopia, was the visual field contracted. In two cases there was diplopia, and in a third monocular diplopia; in two cases the pupils were sluggish, and in one case there was nystagmus. Very pronounced objective symptoms were wanting. One of the unreported cases had been diagnosticated by several well-known neurologists as disseminated sclerosis; the other had sluggish pupils and no knee-jerk.

Seven other cases which, as far as I know, are still alive, presented similar symptoms: pain in the head and back, a diminution of the mental powers, insomnia, palpitation, loss of appetite, indigestion, urinary disturbances, muscular weakness, the movements being slow and feeble, anæsthesia or hyperæsthesia, and, occasionally, tremor. The pain in the back was usually due to traumatic lumbago. Occasionally, but not often, there was inequality of the pupils, or of the knee-jerks, or ataxia. The visual field was seldom affected, and the circulatory symptoms, except palpitation, were seldom pronounced. Except for a moderate amount of mental failure, and some irritability and depression, the physical symptoms were of slight importance. In only one case, in which there was incontinence of urine, reaction of degeneration, and muscular wasting, was the anæsthesia sharply limited to one side of the body. As a rule, it was diffuse, and seldom absolute; the sensibility was much blunted in the legs, and gradually became more acute on passing up the body, the arms showing distinctly less diminution; the diminution was not sharply defined.

There were four other cases with neurasthenic symptoms, where there was also a general muscular weakness, slow, feeble movements, and a similar diminution of sensibility. I am more disposed to class these cases with the other eleven as cases where there was probably organic disease, but they are on the border between the organic cases and the neurasthenic, and I am willing to give the skeptics the benefit of the doubt, and leave them unclassified. Nevertheless, I am disposed to think that this condition of muscular weakness, with slow and feeble movements, and of anæsthesia such as has been described, where there is no sharp limitation of the anæsthesia, but where the sensibility is most diminished in the legs, and shades off gradually to a mere hyperæsthesia as you go up the body, has some significance. The condition certainly does not exist in the typical cases of traumatic neurasthenia, or of neur-

asthenia of non-traumatic origin. If it be hysterical, the cases certainly differ from the cases of hysteria so often reported, or from the cases of undoubted hysteria that I have myself seen; and the hysterical mental state and the other hysterical stigmata, upon which French observers lay so much stress, are certainly absent, or, at least, careful examination has failed to reveal them.

It is in regard to cases of this class that much doubt exists and that much controversy has arisen. In the present state of our knowledge, we can hardly establish definite distinctions which may enable us to say that one case is clearly organic and another neurasthenic. Indeed, it is probable that no such sharp division exists; cases where there was at first merely a functional disturbance in the central nervous system, manifesting itself as simple neurasthenia, may later develop more permanent structural changes. I am not prepared to say that I have been right in putting every one of these eleven cases in this class. There is, however, a condition due to a more or less diffuse or disseminated sclerosis of the central nervous system, as has been proven by autopsy, and I believe that some of these eleven cases—at least, the fatal ones—were due to similar morbid changes. At any rate, the condition is too important, and probably too common, to be disregarded or to be denied. Whether the muscular weakness and hyperæsthesia are indicative of it is uncertain, but I believe they mean something more than ordinary neurasthenia.

None of the affections thus far described, except neuralgia, can properly be termed a neurosis. In some of the cerebral cases, of course, there may have been no structural change, for, as I have said, the underlying pathology of these cases is probably varied; but in the rest we probably have to do with distinct structural changes in the nervous system. Furthermore, in these affections the psychical etiological factor, upon which Oppenheim and Strümpell lay so much stress, has been, in my experience, insignificant; the physical injury, "concussion," has played the chief part. This is not unnatural. Structural changes are more apt to be due to physical causes, while emotional disturbances usually give rise to the so-called "functional" affections.

These functional affections are the only ones that can properly be termed traumatic neuroses, and, as there is more than one, we must use the plural, and not speak of the traumatic neurosis. Under this heading we must consider neurasthenia and hysteria, but we must remember that in both instances we have to do with morbid states rather than with individual diseases, and we may expect to find not only that the boundary between them is indistinct, but that the two overlap. Furthermore, these conditions may and sometimes do coexist with other affections, even with organic nervous diseases.

I have grouped twenty-six cases under the heading of neurasthenia.

The term is vague, and is often carelessly used. As I have said, it is a morbid state which may coexist with other affections, and must exist, to a degree, in every condition of general weakness. Nevertheless, we may derive some help in comprehending it if we bear in mind the two simple, yet fundamental, factors in its nature, that it is a condition where the nervous system responds to stimuli weaker than normal on the one hand, and becomes fatigued on exertions much less than normal on the other.

It is a curious fact that few Continental writers have much to say about traumatic neurasthenia. The French admit its existence, but in their zeal for describing hysteria and for supporting the thesis, *tout est l'hystérie*, they naturally say little about it, while the Germans, admitting that the traumatic neurosis has many points of kinship with neurasthenia, seldom use the term traumatic neurasthenia, or attempt to differentiate it from other forms of traumatic nervous disease.

It is possible, I think, to recognize two varieties of traumatic neurasthenia. The first is of emotional or psychical origin, and is seen in the neurasthenia that follows some great calamity which produces a profound impression on its victim. We have all of us fallen down stairs, or slipped upon an icy sidewalk or a banana-peel many times in our lives. Hence such accidents affect us only by their physical consequences; there is no terror or excitement about them. A fall from a scaffolding or from a carriage drawn by a runaway horse has a much greater psychical effect; while a great railway accident, where a score are killed and a hundred injured, with all its attendant horrors, will produce a profound and permanent impression on the most stolid brain.

In the neurasthenia that follows some great disaster, the psychical symptoms are usually highly developed. The accident haunts its victim, and he dwells on it with a morbid persistency. He may be rendered apathetic, or he may display profound emotional instability. Insomnia, frightful dreams, and extreme excitability and irritability are prominent symptoms. With these we note headache and backache, the latter due either to spinal irritation or traumatic lumbago, or both, loss of appetite, dyspepsia, incapacity for protracted mental or physical effort, nervousness, hypochondriasis, and melancholia. More especially in these cases do we find these slight changes in disposition: the irritability over trifles, the uncertainties of temper, the lack of cheerfulness and buoyancy, and the fretful and fault-finding tendencies, which make the victim far less comfortable to live with.

Neurasthenia of physical origin differs somewhat in its manifestations. The emotional disturbance is less marked. There is less excitability, and the depression is thus more manifest. There may be as much insomnia, although, as a rule, the patients sleep better; but even if there be insomnia, the patient does not have such frightful dreams. Headache and backache are common to both forms. In both forms,

too, there is the rapidly induced fatigue, the incapacity for protracted effort, the feeling of impending calamity, the dread of any event or undertaking outside of the ordinary routine of life, the morning depression and tire, the dyspepsia, the asthenopia, the palpitation, and the rest of the familiar symptoms so common in all neurasthenic conditions. Sexual weakness or psychical impotence are common in men, and menstrual disorders in women.

There are certain objective signs in these neurasthenic conditions, which, in the general paucity of such signs, have some value in medico-legal cases. In twenty-one cases there was a rapid pulse, running from 84 to 140, and occasionally being weak and irregular. In two cases, one of which was also hysterical, and is therefore classed as such, the pulse was persistently below 60. This rapid pulse is often an indication of the nervous condition. In addition, we often find other indications of a defective circulation—shortness of breath, palpitation, and coldness and passive congestion of the extremities.

Another objective sign of some value is exaggeration of the knee-jerk, which again shows the increased excitability of the nervous system. This exaggeration does not much exceed the normal limit, and there is no true clonus, but the jerk is lively, and may be obtained by percussion above the patella as well as by percussion below; there is also a lively twitch if the patella be drawn down by the finger, and the finger be struck in the same direction as the traction.

In a few cases, most of which are not absolutely typical, I have noted a slight limitation of the visual field, or some anæsthesia or analgesia. Unless the four doubtful cases be regarded as simply neurasthenic, limitation of the visual field and anæsthesia are rare, and are not found in typical cases. In no case was there any sharply limited anæsthesia like the hemianæsthesia, geometrical anæsthesia, or islets of anæsthesia of hysteria. The limitation of the visual field was also slight, the horizontal meridian never showing a nasal measurement below 50° , or a temporal measurement below 70° .

In ordinary, non-traumatic neurasthenia we are all familiar with the shifting character of the symptoms. The woman who to-day is on a bed of pain in a darkened room, may to-morrow be the life of the company. With this comes, as in hysteria, a morbid craving for sympathy. The patient, under a sufficient stimulus, may rise superior to her ill feeling, especially if she be isolated from unwisely sympathetic friends. Under such circumstances we know how prone the exhausted relatives, nurses, and physicians are to think the trouble imaginary. Too often the physician, unfamiliar with such troubles, fails to realize that it is not "I will not," but "I cannot will." Just such a case has recently been under my observation; a young woman has for years been regarded as an imaginary invalid by her relatives, largely on account of these sudden

fluctuations in her condition. If her trouble were due to a railway accident instead of to a fall down stairs, it would have been very difficult, if not impossible, to meet the charge of simulation, which is so often and so ignorantly made; yet she has suffered for eleven years.

In spite of these puzzling fluctuations in the condition, one symptom is usually constant. The neurasthenic patient can make a single spurt which shows equality with or superiority to the person in average health, but the consequent exhaustion is much greater and the power of steady and continuous application is absent. This should be our guide, but it is needless to say that in litigation cases it is far from a certain guide; nevertheless, with the danger that the railway companies may be defrauded, there is at least an equal danger that injustice may be done to patients of this class.

It does not seem necessary to give any elaborate description of traumatic hysteria. It is characterized by a peculiar mental state, by convulsive attacks, and by the presence of certain well-recognized stigmata. These stigmata are: anæsthesia (either in the form of general anæsthesia, hemianæsthesia, geometrical anæsthesia, disseminated islets of anæsthesia, or, more rarely, dissociated anæsthesia); hyperæsthesia, sometimes associated with hysterogenous zones; various forms of paralysis and contracture; and various disturbances of the special senses, of which limitation of the visual field is one of the most common. An unstable emotional condition, by itself, can hardly be regarded as diagnostic of hysteria, for it occurs in many conditions of weakness, and may be associated with various diseases. French writers lay especial stress upon the stigmata just mentioned, and therefore we should look for them in every case.

I have classed seventeen cases as hysterical, but am not prepared to defend the diagnosis in every case; for where there was any doubt as to whether a case might be hysterical, I have classed it as such. One of the cases was a case of typical hysterical joint disease; two exhibited emotional disturbances of an hysterical type, with slight anæsthesia; one had general anæsthesia with hyperalgesic regions; one had convulsive attacks, possibly of an hysterical character; one had hysterical monoplegia; the rest, eleven in all, had hemianæsthesia. Many of the cases had characteristic hyperalgesic regions. Most of the cases of hemianæsthesia had contraction of the visual field, often on the anæsthetic side alone. In the case of general anæsthesia the field was normal.

In the majority of cases there were additional symptoms which can hardly be regarded as hysterical: headache, backache (either from traumatic lumbago or from "spinal irritation"), insomnia, depression, nervousness, irritability, incapacity for protracted effort, a rapid or irregular pulse, cold extremities, dyspepsia, etc., the whole series of symptoms which we have just been considering in cases of neurasthenia.

It is, then, not pure hysteria, but hysteroneurasthenia with which we most frequently have to do.

I doubt whether hemianæsthesia and contraction of the visual field can be regarded, as the French tacitly seem to do, as pathognomonic of hysteria. After the well-known investigations of Thomsen and Oppenheim,¹ it seems pretty clear that these symptoms may exist in other affections, nor is it a convincing argument against their views to maintain that they are incapable of diagnosticating hysteria. Moreover, if the anæsthesia be not sharply defined, but be merely a blunting of sensibility, more marked in the legs than in the arms and without any hyperalgesic zones, I doubt very seriously whether that be pathognomonic of hysteria. At any rate, I have seen it in cases that resulted fatally.

Even if hemianæsthesia and contraction of the visual fields be pathognomonic of hysteria, they are of comparatively rare occurrence. In only fourteen out of ninety cases was there hemianæsthesia or geometrical anæsthesia. Of contraction in the visual field I can speak less definitely, for circumstances in a good many cases prevented a perimetric examination. This, however, I can say: that in some hysterical cases, and in many other severe cases, careful perimetric examination has revealed no limitation of the visual field.

The "traumatic neurosis" of Strümpell and Oppenheim has found no place in this classification. The cases of psychical origin are more apt to be neurasthenic or hysterical, and the psychical symptoms are most pronounced in these two classes. Of the three objective or semi-objective signs on which Oppenheim lays stress, the pulse disturbances are most pronounced in neurasthenia, the anæsthesia is most marked in hysteria or in the cases of diffuse cerebro-spinal sclerosis, and the limitation of the visual field is most marked in hysteria. The last two symptoms, however, are, as I have said, often lacking.

A series of cases like these, where about half the patients were claimants of damages and the other half were not, ought to afford a striking array of "litigation symptoms." They certainly disprove the claim that such cases never arise except when there is a prospect of heavy damages. For some reason, after careful study of the cases, I am unable to find these remarkable "litigation symptoms" on which Page lays so much stress. The symptoms have been much alike in the two sets of cases. I have seen patients accused of malingering. I have known them to exaggerate their symptoms and to lie squarely as to their powers to do certain acts. I have known them to grow much worse when under observation or when sympathy was to be aroused. I have known them to recover very speedily under certain moral stimuli—and there was no claim for damages involved. I have known patients to make light of

¹ Archiv für Psychiatrie, 1884, xv. 559, 633.

their symptoms, to understate their sufferings, to put on a brave face and do their best to keep on with their daily duties and to support themselves and their families—and yet they had a claim pending against a corporation. Naturally we may find the first condition existing when there is a suit pending, and yet we must recognize the fact, if we know anything of nervous diseases, that it is possible even then that there is no wilful deception. Exaggeration is common in many nervous affections, whether there be a suit pending or not, but successful simulation is, in my opinion, rare. I am enough of a pessimist to admit that many persons are willing to swindle a corporation if they can, but I believe that few of them have the skill to simulate these conditions with success before the thorough examination of the neurologist. “En pathologie,” says Gilles de la Tourette,¹ “cette idée de simulation ne hante guère avec autant d’insistance que le cerveau de ceux dont l’éducation scientifique, sur le point en litige, est encore à compléter.” On the other hand, I am pessimist enough to believe that corporations are not always immaculate, and that the possession of money may sometimes lead to the purchase of testimony or the bribery of jurors.

The prognosis of these affections must depend, of course, upon the form of the disease. In traumatic lumbago, in some of the milder cerebral cases, and in the neuroses there are chances of recovery, but in the neuroses especially the patient may become a permanent invalid.

PROVISIONAL CLASSIFICATION OF TRAUMATIC NERVOUS AFFECTIONS.

(Ninety Cases.)

		No. of cases.
Extra-vertebral lesions	Lumbago	8
	Neuralgia	1
Spinal lesions	Acute	Fracture
		Dislocation
		Hemorrhage
	Softening	5
	Chronic	“Spinal concussion”
		Systemic disease
Cerebral lesions	Fracture	Not included.
	Hemorrhage	
	Meningitis	
	Epilepsy	
	Insanity	
	“Chronic cerebral concussion”	13
Diffuse or disseminated cerebro-spinal sclerosis		11
Doubtful cases, possibly sclerosis		4
Traumatic neuroses	Neurasthenia	26
	Hystero-neurasthenia	17
	Hysteria	
		90

¹ Gilles de la Tourette: Traité clin. et théor. de l’Hystérie, i. 121.

The present attempt at a classification of traumatic nervous affections is merely provisional. Our knowledge is still too vague to enable us to make a complete classification or to establish absolute diagnostic distinctions. I hope that I have succeeded in showing that "traumatic neurosis" is hardly an applicable term; that we have many affections to deal with, some cerebral and some spinal, some organic and some functional, some of physical origin and some of psychological, and that in the individual case we must endeavor, both in regard to treatment and to prognosis, to determine as definitely as possible the precise condition with which we have to do.

ON THE DIFFERENTIATING ACTION OF ALCOHOL IN THE NERVOUS SYSTEM; WITH OBSERVATIONS ON ITS TOXIC SYMPTOMS.

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THERE is an obvious uniformity in the constitution and structure of the same organs in the different members of the human species. But while this cannot be gainsaid, it is to be observed that there is also great inherent diversity. With the same features it is proverbially true that no two faces are alike. There is no reason to think that this variety is confined to external form. In the arrangement of the elemental cells and fibres of internal organs it is no extravagant opinion to hold that within certain limits there are like diversities in different individuals. The peculiarities—or, otherwise, the diversities from the normal standard—which are known as idiosyncrasies are most satisfactorily explained by this assumption. Indeed, we may certainly conclude that, related to those natural differences of disposition and habits of thought to which we give the name of temperaments, there are corresponding varieties in the combinations, chemical as well as physical, and perhaps also in the movements of the molecules, by means of which the brain and nervous system generally are built up. Such specialties in the structure and association of cell and fibre are, I need scarcely say, beyond our power of appreciation by examination, even with the help of the most delicate instruments of research. But though this is so, their existence is evinced in other ways. Confining our attention to the central nervous system, we see these minute structural differences in the varying responses in different persons to the influences of the same environment. They are shown by the greater or less readiness of ganglionic centres, great and small, to fall into disease. They become still more obvious,

and can be more readily distinguished from each other through the action in the body of certain agents more or less toxic in their nature.

Of such agents, alcohol possesses this differentiating property in a high degree. It is evident in the diverse phenomena of intoxication in different individuals. In some, wine or stronger spirit is a revealer of their true disposition and character. Training and culture may have so veneered them that it may be very difficult to arrive at a correct conclusion respecting their real mental and moral characteristics. Alcohol dissolves the mask. Induce them to take a strong spirituous liquor in moderate excess, and the innate nature will be disclosed. The irate man becomes more angry and irritable, and perhaps disposed to dangerous violence; the conceited man is louder in his boasting; the deceitful man evinces his cunning; the lascivious man wallows in his moral filthiness.

But though this is true of many persons, in not a few its action is apparently quite the reverse. While under the influence of the intoxicating cup their nature seems changed: the timid man becomes valiant; the amiable, quarrelsome and unbearable; the cool and self-possessed, hasty and impetuous.

The unveiling property of alcohol is sometimes shown in states of mental unsoundness, particularly where the disorder is partial, and relates only to one or two subjects. Thus, the writer has observed that the delusions of a female lunatic were apparently intensified, at all events were more pronounced, during the time she was intoxicated.

The varying resisting-power against the same toxic agent, implying fundamental differences of tissue, is probably most clearly shown when alcohol is taken to such an extent as to give rise to definite disorder of the nervous system. There is great variety in the symptoms so produced. While in the majority all the leading functions are more or less involved, it is not uncommon to find the indications referable to one alone distinctly marked. In some persons motor phenomena are very prominent; in others, sensory disturbances, special or general; in a third but smaller group, vasomotor and glandular abnormalities; in a fourth and large one, psychical manifestations predominate.

I shall now illustrate these differences by cases which have occurred in the course of my experience. They were for the most part observed in the Town Hospital and City Parochial Asylum of Glasgow; a few were in the Royal Infirmary and elsewhere. In the exposition of the subject the chief functions of the nervous system will be taken up in succession, and it will be my endeavor to show how deeply one of them is involved in one class, and another in a different group of cases, through the action of the same agent. In saying the "same agent," I am taking for granted what is only correct generally, that the whiskey, or, in exceptional cases, the brandy or gin, which in my patients was

the exciting cause of the disturbances of their nervous system, was of much the same quality in them all. We may safely assume that the spirituous liquors drunk by the class of people who were admitted into a parochial asylum or poorhouse are generally more or less impregnated with fusel oil, and the proportion of this impurity varies even in the same liquor at different distillations. It is obvious, therefore, that any conclusions founded on the cases about to be submitted are subject to the qualification that the toxic agent varied to some, but probably not to a great, extent. In this connection it may be well to state that I have excluded all cases in which the patients had been drinking what is known as "finish," a coarse and very deleterious methylated spirit that some drunkards—at least, a few years ago—were in the habit of taking in this part of the country.

Disorders of motor power. We will consider these first. The motor centres have, proportionately to those associated with other function, little power of resistance in some persons. The following cases illustrate this observation :

CASE I.—T. M., aged forty, admitted May 20, 1877. His son states that the patient has been of drunken habits for twenty years, and was drinking very heavily for three weeks just before admission. Careful examination failed to detect delusion or psychical disturbance of any kind except agitation, and there was no perspiration. The only prominent symptom was great general tremor, affecting the muscles of the face, as well as those of the extremities. I filled a glass of water and asked him to drink it, when he spilled at least a tablespoonful in putting it to his mouth. The tongue was moist and slightly furred, and the pulse was 96. Under treatment the tremor rapidly subsided, and he was dismissed on the fourth day after admission.

CASE II.—J. G., aged thirty-six, commercial traveller, admitted May 21, 1875. He has been much addicted to drink for many years. My note is : "There is a general tremor, perhaps as much as I ever saw, and yet there is no delusion or fear, and altogether the mind is clear." Chloral hydrate was administered, but he slept none for two nights; thereafter he slept, the tremor passed away, and he was dismissed as recovered five days after admission.

Sudden startings of the whole body, sometimes exceedingly severe, are very common in persons suffering from the acute toxic action of alcohol. They are generally most marked when the patient seems about to sleep, and usually arouse him, preventing the longed-for rest. According to my observation they are by no means most evident in patients who are very tremulous; on the contrary, in some cases at least, there would appear almost to be an antagonism between these symptoms. The following case shows this :

CASE III.—J. D., aged forty-six, glassblower, admitted July 9, 1867. I learned from his employer that patient had been of drunken habits for very many years, and he himself stated that he had been in the

"blues," *i. e.*, delirium tremens, a dozen times. On the present occasion he has numerous hallucinations both of sight and hearing, perspires much at intervals, has slept none for four days together; pulse is 120, and weak. When he stretched out his arm at full length, the hand was quite steady, and I could observe no tremor of the fingers. He, however, complained of sudden startings throughout his whole body, which were most troublesome when his head rested on the pillow. Two or three times I noticed this starting when I was speaking to him, just as if an electric current had passed through his muscles.

The following is corroborative of the same point:

CASE IV.—J. M., aged thirty, salesman, admitted September 17, 1867. He has been very intemperate for thirteen years, and is sure that he has had twenty attacks of the "blues." His present drinking-bout began six weeks since, and previous to the last four days he drank about twenty glasses of whiskey a day. He has numerous hallucinations of sight, hearing, and smell. The note respecting his motor symptoms is as follows: "Is very startish, but there is little tremulousness."

Such jumpings or startings indicate a tendency to epileptoid convulsions. This is shown by

CASE V.—W. G., aged thirty-three, engineer, admitted June 21, 1875. He has been of drunken habits since he was fifteen years of age. He ordinarily drank about five glasses of whiskey a day, but occasionally a full bottle. His first convulsive attack occurred two years ago; the second, two days since; and the last, since his admission. It is noted that after drinking, and apart from the convulsions, he has often crampy feelings in the legs and startings both in arms and legs.

The convulsions of alcoholism do not often occur except as a direct effect of recent potations. Still, cases are now and again met with in which the epileptic habit would seem to be established by frequent and protracted excesses. The fits then recur, though the patient may have abstained from drink for a considerable time. This is illustrated by the following case:

CASE VI.—J. B., aged thirty-four, laborer, admitted April 5, 1874. He has been of drunken habits for sixteen or seventeen years, but never suffered from delirium tremens. Previous to the last three years he had been in Australia and New Zealand for thirteen years, and states that when there he was in the habit of taking three or four quarts of rum daily. However, he says that this liquor in those countries was not above half the strength of the kind drunk in Britain. About thirteen years ago he had his first convulsion-fit while abroad; it was general, affecting both sides of the body. For three or four months afterward he had similar attacks nearly daily, and occasionally twice or thrice a day, although he was getting no alcoholic liquor. Then he ceased to take them and had none for a considerable period. However, after renewed excesses on his return to Scotland, they recurred and he had a fit daily, or nearly so, in the Town Hospital during three weeks, and then they

gradually ceased under the use of bromide of potassium. He had, I need scarcely say, no alcoholic liquor during this time.

Epilepsy and epileptiform attacks of alcoholic origin do not differ in their general manifestations from those due to other causes. Still, in most cases—though the exceptions are many—the seizures due to alcohol are more severe and are more commonly met with in groups, with brief intervals between the attacks, than in ordinary epilepsy. French writers, for example Dr. Dagonet, have stated that the effect of such seizures on the mental faculties is more profound than that of ordinary epilepsy. This does not accord with my experience. On the contrary, it has seemed to me that so long as the patient remains free from paralytic complication, the epileptic attacks of alcoholism, particularly those of the acute form, do not exert so deleterious an influence on the mental powers as those due to ordinary causes. For example, the note-book entry on this point respecting Case VI. is: “Faculties acute, and mind as clear as ever it was;” and I could quote others to the same effect. This want of correspondence between our respective observations may probably be due to the fact that the favorite strong liquor of the French, particularly in Paris, is absinthe, in which alcohol is combined with wormwood. This spirit, when taken to excess, is much more apt to give rise to convulsions than our whiskey, and these are very apt to occur in paroxysms severe and prolonged. There is thus a difference both in the constitution and the effects of the two agents.

The sensory system, and more particularly the special senses. The parts of the brain associated with sight and hearing are apparently more liable to suffer than those that subserve the other senses. It is worthy of remark that some other agents, such as opium, also act more decidedly on these two senses, which likewise suffer most in the morbid states of the brain which give rise to ordinary insanity. In the patient laboring under acute alcoholism, so long as there is little organic change in the cerebral tissue by previous excesses, hallucinations of vision, as a rule, take precedence of those of hearing; but the latter are seldom long in following, and, indeed, occasionally take the lead. Further, the visual hallucinations may exist alone, as the following case shows:

CASE VII.—M. Mc., aged twenty-five, admitted July 15, 1892. She had been four days in prison for being drunk and disorderly. On dismissal she again took to drinking, and in four days more was in the asylum. She maintained that in the prison-cell a large number of men and women appeared in ball-dress, and also that a crowd of children, just as if they had come from school, came in at the window. She is sure that none of them ever spoke. Taste, smell, and feeling neither were nor had been affected. There was no tremor. In less than a week she was free from her delusive ideas.

On the other hand, when hallucinations spring up in the chronic alcoholic from a new excess, or other cause, those of hearing are gen-

erally]the first that disclose themselves, and, more frequently than in the case of sight, they are unaccompanied by disorder of the other senses, at least with that of vision. The following case illustrates this restriction to the sense of hearing.

CASE VIII.—J. M., aged thirty-two, admitted June 17, 1882. He states that he has been addicted to steady, hard drinking for fourteen or fifteen years, and that during the last few weeks he has consumed even more than his usual quantity. Three days ago he began to hear imaginary voices which charged him with murdering people, and he wishes to be “put out of the way” at once. He denies ever having seen any of the figures that afflict alcoholics, nor has he been troubled with unpleasant smells or tastes. He was found to have a steady hand and to be free from general tremor. Pulse was 78; tongue moist and clean.

Hallucinations of smell, though far less common than those of sight and hearing, are by no means of infrequent occurrence. They were prominent in

CASE IX.—P. T., aged fifty-two, laborer, admitted April 10, 1874. For twenty years he has been in the habit of taking whiskey to excess, though occasionally he would abstain for three or four months at a time. He suffers from hallucinations of smell, hearing, sight, slightly of taste, and distinctly of common sensation. The figures that trouble him are mostly those of small women; and he states that he finds the *smell* of them before they come. He describes the sensation as a kind of sulphureous odor in both nostrils; said, “I never see the figures until after I find the smell.” On inquiry I ascertained that no smell accompanied the subjective voices.

It is difficult to determine in most cases to what extent the unpleasant taste which alcoholics complain of is imaginary and how far it is real; there is usually sufficient disorder of the digestive system to account for much disturbance of this sense. My impression is that the gustatory centre seldom gives rise to distinct hallucinations from alcohol, though delusions connected with taste are by no means uncommon in ordinary insanity.

A hyperæsthetic condition is occasionally met with in acute alcoholic disorders. However, it often partakes more of hyperalgesia, a slight touch being felt as painful. In one case I have noted that the patient complained of a general itchiness of the skin, and in another that he had a feeling of needles going into the legs. Local anæsthesiæ are not infrequent in chronic alcoholism. Thus one patient had a numb feeling in the front of both thighs; a second complained of defective touch in the hands and a “sleepiness” of the legs; and a third said he had a “sleepy” sensation in both arms and legs. Though mentioning these disorders of sensory function, I cannot say that, when of cerebral origin, I have observed them apart from other symptoms usual in acute or chronic alcoholism. They will be further referred to in connection with alcoholic paraplegia.

It is interesting to note the mode of development of hallucinations. Some appear to arise in consciousness in distinct form with little previous disturbance of the sense or senses involved. Others are more vague and less formulated at first, but after an interval of hours or, more rarely, days, they assume definite shape or character. Thus, one patient said that he first began to hear a sound as of music at night, and that a day or two afterward "voices" spoke to him; another also spoke of hearing music, but described it as discordant; a third had a buzzing sensation in the ears, which preceded the imaginary "voices." Subjective sensations of color were sometimes observed before fully formed figures of animals made their appearance. For example, one man spoke of seeing a blue cloud dancing before his eyes when he went up a dark lane. The same night when in bed and trying to fall asleep, men appeared to come to his bedside in a threatening attitude. A woman, aged twenty-six, first saw red and blue stars, and afterward imaginary people apparently began to dance around her. I found that this girl could distinguish colors correctly and without difficulty. Another patient saw balls of fire and objects double before the appearance of more definite and complex forms.

The figures seen were most varied; generally they had the form of the lower animals or of human beings. One patient said that there were bulls and calves, birds and fishes, little men and women in beautiful dresses dancing in his room; a second was very frightened at small serpents that were coming from the walls toward him; and a third saw two soldiers fighting with crossed bayonets. In the last case it is noted that the soldiers appeared to be in dark dress, and it was observed that this man had no imaginary colors before his eyes. A fourth patient, who would not speak on admission, told me two days afterward, when nearly well, that at the time he was obstinately silent he believed he would never die; that he was in heaven, and that he saw Richard III. there.

Generally the animals appeared to be small, but not always; for instance, a patient declared that elephants were trying to get at him. Usually they were first seen at night and when the eyes were closed. In most cases there were more than one of these imaginary creatures. I have, however, a note of a man who was plagued with a solitary monkey that seemed to come out of a hole in the wall and run at him ferociously, but he said that when he tried to get hold of it, it immediately retreated into its hole. He had been greatly worried by its attacks, so much so that shortly before admission he went to the police station and lodged a formal complaint respecting his tormentor.

With rare exceptions these baseless creatures of the imagination were always in motion. In a large proportion of cases they appeared to have a threatening aspect, and to be drawing near for the purpose of

attack; but in others they never came nearer than about the foot of the bed, and did not seem to have any clear evil design. In one or two instances they were quite stationary, not moving at all.

Most of the alcoholic patients see these imaginary objects with both eyes, and hear the "voices" with both ears; but in not a few they were one-sided. Thus I have notes of about a dozen who heard the "voices" only with one ear; and it is worthy of observation that they were mostly on the left side. In two or three cases the delusive figures were seen only by one eye. In a paper read at the London meeting of the International Medical Congress, eleven years since, I directed attention to this fact and its significance. As it is a good illustration of the proposition which I informally stated at the outset, namely, that there are in some cases physical differences between homologous parts of the nervous system which reveal themselves by distinctive symptoms produced by the same agent, I here quote two of the cases which were recorded at some length in that paper.

CASE X.—J. C., aged thirty-two years, grocer, admitted January 19, 1881. He was brought to the hospital from the police office, where he had gone seeking protection from an imaginary crowd of people that seemed to follow him on the streets. He admitted having been of drunken habits for from fourteen to seventeen years, and during that time had drunk from seven or eight glasses to a bottle of whiskey daily. Two days after admission he spontaneously stated, no question having been addressed to him on the point, that the "voices" and less formulated sounds which had troubled him during his illness were all on the left side of the head. He said that he still heard them, but now they seemed to be like his own voice coming back to him; for instance, when he said to himself, "Go home and see the wife," a voice repeated "Go home and see the wife." The hearing-distance, as tested by the watch, was found to be about a yard on each side. Besides the hallucinations of hearing and sight, there was no appreciable disorder of the senses.

CASE XI.—T. S., aged twenty-eight years, admitted November 28, 1874. This woman said that she had been of dissipated habits for several years. She had fully recovered when she gave me the following history of her illness: About three weeks previous to admission a voice began to trouble her on the left side of the head. It seemed that of a man who spoke to her in a loud and threatening tone. She is quite sure that, whether lying in bed or walking about, the voice was on the left side only. It was most troublesome in the evening and during the night. She believed it to be real at those times—so much so, that she was on the point of jumping out of the window through alarm at the threats of violence; but, generally, when heard during the day she considered it must be a delusion. The tick of a watch was heard in the left ear at the distance of six inches, and at ten inches in the right one. Vision was also involved. She imagined the day before her removal to the asylum, when in bed and quite awake, that she saw her mother standing naked before her. For a day or two she had also been troubled with the appearance of a dark cloud before her eyes, through which red lights sparkled. Frontal headache was then often very troublesome. Eyesight and pupils were

normal. Smell has always been correct. Every article of food tasted bitter, and there was also want of appetite. Common sensibility was found to be correct, and not apparently in any way deranged.

Unilateral hallucinations, as I pointed out in the paper referred to, give support to the prevailing doctrine of localization of function in the cerebral hemispheres. In accordance with it, the cortical centres of the hemisphere related to the particular sense involved, and opposite the side of the hallucinations, are specially disordered by the alcoholism.

The delusions of alcohol are very apt to lead those that entertain them to act under their promptings—more so, as a rule, than morbid subjective sensory impressions that have their origin in other forms of mental disorder. It is almost a matter of surprise that so few insane patients who are troubled with imaginary voices and visions, not alcoholic in their causation, are dangerous through the influence of their morbid fancies. Of course, they occasionally are, particularly when the illusions or hallucinations are associated with a feeling of morbid suspicion or profound depression. But a dangerous disposition is much more marked in alcoholism. The inebriate who is so affected is very generally moved to action through these diseased imaginations and the feeling of fear with which, in almost all cases, they are so intimately associated. Thus, in one medico-legal case with which I was engaged, a father killed his child under the illusion that it was a horrid beast which was about to attack him. He had given himself up to drinking for some days previously.

In 1874 I was a witness in the trial for murder of a chronic alcoholic who was subject to occasional acute exacerbations with delusions, both through fresh excesses and other causes. He had killed his wife, under, I believe, the influence of an insane hallucination, the exact nature of which was not disclosed. There was so much of method and reason in his manner of committing the act, and in his conduct both before and not long after it, that the jury found him guilty, and he was condemned to death; but eventually the sentence was commuted to confinement in a criminal lunatic asylum "during Her Majesty's pleasure."

But the hallucinations of the alcoholic, particularly those of hearing, more frequently induce suicidal attempts, especially when the form of mental disorder is of the delirium tremens type, or is melancholic.

Prompted by imaginary voices, several patients who were sent to the Town Hospital had previously thrown themselves into the river. One woman thought she heard her deceased sister crying "Come to me, come to me," and in obedience to the call rushed into the water; others had jumped out of the window to escape from their imaginary pursuers. One night, on visiting the bedroom of a stout man suffering from acute alcoholism, I found him busy cutting his abdomen with a piece of a broken chamber-pot. He had inflicted a number of wounds on himself, but

The following case is illustrative :

CASE XIII.—W. W., aged forty-seven, lately wine-taster, previously hotel-waiter. Admitted into Royal Infirmary, February 15, 1887. He has drunk freely for twenty-five years. He denies having had syphilis. His lower extremities are paralytic to a considerable extent, and they have also undergone a certain amount of atrophy. There is complete loss of sensibility in all its forms below the right knee, with a subjective feeling of burning in that part of the limbs. Marked pain is felt on pressure along the course of the tibial nerves. Superficial and deep reflexes are absent in the right leg, but are exaggerated in the left one. Besides the condition of his limbs, he had lost, as he supposed, his sense of taste; and this had entirely unfitted him for his occupation. I found, however, that it was not his taste, but his sense of smell which was at fault, so that he was unable to appreciate the bouquet of wines. The patient's mental condition was and had always been quite sound.

In this patient the toxic action of the alcohol had apparently been concentrated almost entirely on the nerves of the lower extremities and on the olfactory nerves. The higher parts of his nervous system did not appear to have suffered at all. But it is not uncommon to find a degree of mental impairment associated with the paraplegia. In one case under treatment last year this combination existed. The patient, a man of fifty, recovered in about three months from the paralysis and also from the mental defect. Though much addicted to drink, he never had suffered from delirium tremens. In another instance of a similar association, the patient, a man about thirty, recovered from the paraplegia, but not entirely from the mental defect, which in him was chiefly in memory. Through the impairment of it he became involved in a criminal charge, which led to my connection with the case.

In conclusion, it is submitted—first, that the facts here recorded bear out the statement that in many cases alcohol is selective in its toxic action on the nervous system, affecting different parts in different individuals; and, second, that this selective property is dependent on peculiarities in the constitution of the nerve-tissue, either congenital or acquired.

ANGEIO-NEUROTIC ŒDEMA.¹

A CONTRIBUTION AND CRITICAL STUDY.

BY JOSEPH COLLINS, M.D.,
OF NEW YORK.

THE disease that has become known to English-speaking physicians as angeio-neurotic œdema has now reached such a stage in medical literature that it merits the consideration of a critical study. And as it is

¹ Presented to the American Neurological Association, June, 1892.

about to take its place in the text-books of the present day, it behooves us, before it takes an unimpeachable position in the nosology of medical science, to have as proper a conception as possible of at least its clinical course and etiological factors, with its ordinary duration and distribution.

Although some of the most important contributions to our knowledge of this affection have emanated from investigators in this country, such as Osler, Matas, Hartzell, Simon, Lovett, Juler, and others, yet no attempt has been made, so far as I am aware, to treat the subject exhaustively. A possible exception is that of Lovett, who has made a contribution of much substantial merit. More recently Simon has published some carefully observed and recorded cases, with an analysis of the cases of some other investigators.

The advent of a new disease into literature is generally marked by two epochs. First, it is observed by some astute and careful clinician, who notes the symptoms and, as a rule, publishes them without comment. It attracts but little attention until another takes it up, analyzes, experiments and observes, and at last carefully publishes, and so introduces it to the scientific world under favorable auspices. The results are that it attracts profound attention and receives the merited study. He who stands sponsor for its advent at the second epoch deserves as much, if not more, praise than he whose acuity of observation detected it.

The disease under consideration, variously termed acute circumscribed œdema, acute idiopathic œdema, angio-neurotic œdema, periodic swelling, urticaria tuberosa or giant swelling, acute non-inflammatory œdema, Australian blight, is an affection which although spoken of in medical literature since 1827, has been recognized as a disease having sufficient individual characteristics to have a history and special designation of its own only during the past decade. It is undoubtedly to Quincke and to his pupil Dinkelacker that we are indebted for calling the attention of the profession to this disease in such a clear and explicit way that the affection was instantly recognized as it presented itself to the notice of different physicians in different parts of the world.

The term angio-neurotic œdema, under which the disease is most commonly spoken of in this country, is, as far as we are able to say at present, a purely empirical title, as it takes for granted certain factors concerning the genesis of the disease. It is characterized by the appearance of circumscribed swellings on various portions of the body, by preference the face, throat, and extremities, without apparent cause or premonition and frequently associated with gastro-intestinal symptoms which are thought to be dependent on a condition of the mucous membrane of the stomach and intestines similar to that of the skin or larynx when the manifestations of the disease are seen in these parts. Its

sudden advent and disappearance, its recurrence and unamenability to treatment, are striking characteristics of the disease.

The following statements concerning its etiology and symptom-complex are based on a study of upward of seventy-five cases, including all the published cases as far as can be ascertained after a rather complete search of the literature and the unpublished cases of some of my friends, particularly Dr. Allen Starr¹ and Dr. J. Arthur Booth, who have kindly placed at my disposal cases which they have carefully observed and which are yet to be published. Doubtful cases, or cases which do not seem to come entirely under the heading of this disease, as we now understand it, are carefully excluded from the statistics in order that such may be of some value.

Although such doubtful cases are not many, some are to be found—as, for instance, a case recently recorded by Edwards, in which a patient was first seen in September for an attack of nephritic dropsy with albuminous urine, which disappeared, but the patient came under observation later for a swelling in front of the throat which seemed to be connected with the thyroid gland. A month later she died from slow suffocation and starvation. The observer recorded the case under the title of “acute enlargement of the thyroid gland—angeio-neurotic œdema.” For what reason and from what symptoms the latter part of the title is appended we are unable to comprehend, as there is little if anything in the case suggesting angeio-neurotic œdema as we understand it. And, furthermore, not a word is given concerning the urine or the functioning condition of the other organs of the body during the time she suffered from the condition which brought her under the observation of the physician. So I reiterate, in such cases and others where the similarity to angeio-neurotic œdema is somewhat more apparent than in the above case, but still merely suggestive, I have taken the liberty to exercise my own discrimination, not with any disrespect to the reporter, but in order that figures given in respect to etiology and distribution of the lesion may be as accurate as possible.

ETIOLOGY.—*Age.* The period of early adult life furnishes the greatest number of cases, the average age in this series being twenty-seven years; though childhood is by no means exempt, as is seen by a case reported by Dinkelacker in which a child, whose father suffered from the disease, had an attack for the first time when it was three months old. Widonitz also reports cases occurring in early childhood, as does Goltz and others. It rarely, if ever, occurs for the first time in individuals upward of sixty years of age, although this is possible, as Goltz has reported such a case.

¹ Dr. Starr's cases have been published in the N. Y. Med. Journ., Sept. 17, 1892.

Sex. It occurs nearly twice as often in males as in females, although some writers would have us believe there was no difference in this respect. It may be, and probably is, a mere coincidence with the tendency for nervous diseases to occur in our country, but nearly two-thirds of the cases reported as occurring in women have been reported by American observers.

Occupation. Those whose occupation tends to the production of excessive mental and bodily fatigue is the only relationship that can be traced, as is manifested by Case III., in which the attacks came on when the gentleman was exhausting his strength by laborious duties connected with the practice of his profession and his duties at a medical college, and disappeared when a respite was taken.

Heredity. This is one of the most important and interesting elements in the genesis of the disease. It has been pointed out with remarkable accuracy by many observers, particularly by Strubing, Quincke, Falcone, but by none is the evidence made so striking as in the story of the family related by Osler, as is seen by the following table, showing the presence of the disease in five generations and including twenty individuals.

I.	II.	III.	IV.	V.
	Samuel.	{ 3 children, all affected 1 (John) died of it.	{ One girl, affected.	
	Stacey.	{ George.	{ <i>Hamilton</i> ,	{ <i>Thomas</i> .
	<i>Allan</i> , 10 children, 3 affected.	{ <i>Emma</i> , single.	{ <i>Rebecca</i> , died of it.	{ <i>Lizzie</i> .
Margarette, born 1762, died 1834.		{ <i>Sallie</i> , mar- ried, no children.	{ <i>Almira</i> , <i>Mary</i> , <i>Julia</i> , <i>Katie</i> , <i>Edward</i> , <i>Maggie</i> , <i>George</i> .	{ 2 children, æt. 17 and 11, one of whom has recently suffered an attack.
	<i>John M.</i> , 4 children, 1 (<i>Angey</i>) affected.			

Names in *italics* denote individuals who suffered from the disease.

Previous and present condition of bodily health. It has been observed many times and considered surprising that the majority of the cases presenting themselves with this disease are in an excellent general physical

condition; no relationship has been traced to previous, immediate, or remote disease, and diligent examination of the various functions of the body generally shows that they are all in a healthy condition. Of the directly exciting causes we can speak definitively of two only, viz., cold and traumatism. It has been pointed out by the majority of observers that some of their cases showed a predilection to be more common in cold weather, and frequently to result in different parts of the body when directly exposed to cold. This is clearly shown in an unpublished case related by Starr, where the patient states that her hands swell every time that she puts them in cold water, and when winter comes on this swelling on exposure to cold appeared on all parts of the body—*e. g.*, face and legs when out of doors, buttocks when she went to stool in a cold closet, etc. Widonitz, Kirsch, Jamieson, and many others report striking examples of the influence cold has in exciting an attack. In one of Starr's cases some experiments were made with the view of noting the exact influence cold had in precipitating the attack. The left arm was subjected to experiment. It was first tested and found to correspond in point of sensation in every respect with the right. It measured 195 mm. around the knuckles, and 54 mm. around the middle joint of the middle finger. Dynamometer grasp in the left 75, and in the right 85. The hand was then held in water: after half a minute it began to look reddish pink, and when taken out it was mottled, after a minute it had become uniformly bluish red, and at the end of five and a half minutes it was waxy in appearance, the skin was quite glossy, the veins on the back of the hands were distended, and she complained of throbbing in all the fingers. This throbbing was apparent to the touch of the observer. The entire hand had become so swollen at the end of ten minutes that it measured 204 mm. around the knuckles, and 62 mm. around the middle finger. The strength of the hand was much reduced, and a remarkable incident noticed was a great difference in the surface temperature of the two hands, amounting to about 8 degrees.

An attack is most commonly excited by cold, as in passing from a warm into a cold atmosphere, although it does result after severe muscular exercise with consequent sweating and then becoming cool very rapidly. As an example of this, Landon reports the histories of two cases in which oedematous swellings occurred, which affected consecutively many parts of the body, and apparently were induced after perspiring freely from exertion. Jamieson records a case of pulmonary oedema occurring in a young female which he thinks might come within this same category. The patient had been perfectly well and had worked hard during the day within doors, and then at evening-time, when the temperature had fallen a great deal, she went into the garden and stayed for a protracted time. A few hours later, without any premonitory symptoms whatever, she was attacked with great dyspnœa which became aggravated to

a frightful degree, extremities cold, cessation of perspiration, incessant cough, quantities of frothy watery sputum, pale pink in color, no dulness, abundant fine crepitation, audible without bringing the ear in direct contact with the chest; a few hours later the patient was perfectly well. It certainly is not more than a hazardous opinion to say that this was an attack of angio-neurotic œdema, as the abrupt onset and disappearance without warning, and the apparent causation, are strongly in its favor.

Of the second form of direct irritant, namely, traumatisms generally slight, there has been no dearth of observation; a good example is given in a case related by Strubing in the person of a sixteen-year-old boy, whose father had suffered from the disease in an aggravated form for many years, in which the slightest trauma to the hand would be followed by the development of œdema as far as the middle of the forearm or even to the elbow, and when to the forearm itself, this and the arm would be the seat of the swelling. Sorreys has also reported a case illustrating the exciting effect of traumatism, and in Case No. II., reported herewith, the connection is also apparent. The attacks are more frequent in winter and summer than they are during the other two seasons. In the summer, for the reason that it is during this period that sudden cooling after great heating of the body is apt to take place. The time in the twenty-four hours when attacks are most liable to show themselves is during the time between 1 and 5 A.M., when the tide of life is at its lowest ebb and the parts are least resistant.

The area of distribution and the primary point of manifestation is one that has interested me greatly. I find that in a total of 71 cases, the swelling showed itself for the first time: in the face in 29 cases, on the extremities in 22, in the larynx in 5, on the genitals, penis, and scrotum in 3, on the body in 6, on the gums and palate 1, in the stomach 3, on the neck 1, and behind the ear 1. This does not include some doubtful cases, such, for instance, as the case of pulmonary œdema spoken of above, or some histories where the area primarily affected is not specifically given. Of the cases showing themselves upon the face 3 were restricted to the forehead, 3 occurred first on the eyelids, 7 on the lips, and the remainder were distributed to various portions of the face. On the extremities, the hands were by far the most often attacked, and after these, the forearms were the favorite seat. Those given as showing themselves for the first time on the body could not be specifically located; for instance, in one case it was observed for the first time over the crest of the ilium, in another its seat was in the region of the epigastrium, in another on the buttocks, while in yet another it involved the front of the abdomen.

Although this proves conclusively that it attacks some regions by preference, it rarely confines itself to one locality, and its migration is one of its marked characteristics. In a few cases alone has it been observed

to remain in one locality, as spoken of in Case III., in the appended series.

The occurrence of the swelling in one spot seems to predispose that place for future attacks, and it is the exception for it to be once seen in a place that thereafter remains free. Of course, in some of the cases statistics of which are cited above, the swelling did not confine itself at the time of its virgin appearance to the parts mentioned during its whole duration, for frequently it would appear on the face, and in a few hours the larynx or the eyelids, etc., might become involved; but, although it is not at all uncommon for various portions of the body to be swollen at the same time, yet, as a rule—as we shall find when the symptoms are considered—its advent in a second locality was simultaneous with the commencement of subsidence from the part first attacked.

The etiological relation of fright, anxiety, grief, and mental weariness is also very interesting. Lacher recites the case of a very nervous woman in whom the swelling showed itself beneath the eyelid and persisted for twenty-four hours after being hypnotized. Starr speaks of a case in which the only traceable cause was great grief at the simultaneous loss of her three children. Von Hacker, Quincke, and others have observed it in hysterical patients, and although it has no apparent relation to mental influence, it would, theoretically, if our conception of the disease as implied in the name is correct, seem very probable that mental influences which are so active in bringing about other vasomotor changes—such as are seen in blushing, for example—would be likewise very potent in calling into activity these attacks in a person predisposed to them.

The time of the appearance of the swellings has been in some cases very regular; for instance, in the case reported by Matas, they made their appearance at about 11 A.M. every day. In Hartzell's case the attacks always seemed to come on at the same time in the night, and in case No. 1 of this series the patient awakened to find the swelling, no trace of which had been present on retiring. In several of the other cases reported there was a remarkable regularity apparent in the sequence of the attacks, for instance, on the twelfth, seventh, fourteenth days, etc. In a case reported by Simon it showed itself with some regularity every month.

In some cases there would seem to be an inciting influence from the ingestion of certain substances; for instance, in one of the cases reported it was always precipitated by eating fish, and in a case of the series reported by Osler, eating apples was followed by the appearance of the oedema.

Parts of the body which have received injury or have been the seat of protracted pain seem occasionally to be favorite places for development of the swellings. Smith speaks of a case occurring in a woman,

appearing very suddenly on the site of a large birth-mark, and in another case involving the site of a previous erysipelatous attack. Crocq gives an instance of œdema showing itself after a severe attack of cephalgia over the area where the pain had been most severe. In tabes we find the development of œdema in parts where the fulgurating pains are most persistent and severe, and the swellings that follow along the anatomical course of the trigeminus nerve after a severe neuralgia are familiar to all physicians. These certainly are not the œdemas under consideration, but the factors accounting for their existence may not be far removed.

I have purposely refrained from mentioning the so-called menstrual œdema, typical swellings, intermittent œdema after malarial fevers, periodic vomiting of Leyden, and other described forms of circumscribed œdemas, not to speak of the œdematous conditions found with the many paralyses, both central and peripheral, until the present time; for unquestionably some would object to their admission into the statistics of angio-neurotic œdema. That these œdemas are of common occurrence, and not well understood, we must admit. The following history shows such a case:

X., aged twenty-eight years, unmarried. Health excellent until seventeenth year, when she suffered from hysterical attacks for about a year. At the age of twenty she had what was apparently an attack of hemiplegia without assignable cause, and at her twenty-sixth year she noticed that during her menstrual period the upper and lower lips would puff up to two or three times their normal size, and although the menstrual flow would begin with the usual vigor and quantity, there would be a very apparent diminution in the quantity at the time when the swelling began to show itself. At the present writing there is some induration of the lips, but at each menstrual period they do not fail to become greatly enlarged.

This case, occurring in the practice of a fellow practitioner, would seem to be somewhat allied to vicarious menstruation, an occurrence the explanation of which is quite as difficult as the œdema under consideration, inasmuch as the swelling did not show itself excepting concomitantly with the decrease of the menstrual flow, and ceased at a time when the flow should have stopped naturally.

Lewin, and likewise Quincke, cite cases seemingly corroborative of this view. In the former's case the patient had menstruated from the twelfth to the twentieth year, and then at each menstrual period instead of the appearance of the flow there would develop a circumscribed swelling over the right ankle, red in color, resistant to the touch, lasting a variable time, sometimes an hour, sometimes longer, and the patient was frequently troubled with divers other nervous manifestations. The case spoken of by Lewin very much resembles the case I have cited, inasmuch as at the beginning of each menstruation there was developed

a swelling of the upper and lower lip, which disappeared after a short time, but unlike the first cited case the author does not mention whether there remained any induration or not.

Then, again, there is another variety of œdema which has been called to the attention of scientists by Mathieu and Weill, and which they think bears a relation to rheumatism and sciatica. In a case mentioned by them the swelling came on suddenly in the knees, associated with diarrhœa and vomiting, and followed on the next day by great pain over the course of the sciatic nerves.

The intermittent œdema coming on after malarial fevers is probably a natural offspring of the same family as is angeio-neurotic œdema, and we are as completely at a loss to explain exactly its mode of production as in the last mentioned, the mechanism of its occurrence being the same, only that here we have an apparently tangible cause. This variety of œdema is more common in the southern part of our country, although it is by no means limited to it, as it may and does occur wherever malaria is prevalent. It seems quite possible that the case described by Matas was of this division. His patient was an Italian woman, living in New Orleans, who was attacked regularly every day with a swelling of the upper lip, which was cold and clammy to the touch, pitting slightly on pressure, and its appearance was not preceded by any evidence of acute disease, such as a chill, fever, or general disturbance. It would disappear as regularly as it came, in the afternoon, and gave the patient no trouble except by its mere presence. After trying various things for its relief it disappeared under the use of one of the most valuable drugs in the treatment of masked malarial troubles, viz., arsenic in large doses. Another case was in a medical student from the South, seen by me some time ago. This young man had suffered from malarial fever at different times for some years, and about six months previous to his first visit to me he had an attack of typhoid fever, through which he passed very nicely, but on coming North to prosecute his medical studies he found that he was occasionally troubled with a swelling of the fingers of the right hand, while sometimes it would appear above the wrist and on the forehead. He could not say that it came with any regularity, but it was not uncommon to have it two or three times a week. It was not painful, nor did handling it cause him any uneasiness. At first it was supposed to be due to the depraved state of the blood incident to his malarial troubles and the fever, but measures directed toward the relief of this condition were not followed by cessation of the œdema. Large doses of quinine had previously been a steady diet with him, and out of pure force of habit he went back to it, and this was quickly followed by a disappearance of the swellings.

The "periodic vomit" of Leyden is most nearly comparable to the gastric crises of many diseases, such, for instance, as in tabes; and after

considering the symptomatology of angeio-neurotic œdema it will become more apparent that there are manifestations occurring with great frequency in the latter, which very closely resemble the periodic vomit and the crises spoken of. And in this connection may also be mentioned the œdema following in the track of nerve storm or explosion, when the severity of its force has been distributed along the course of the trigeminus, a nerve which in its structure and connections is to all intents the same as a spinal nerve. Many examples of this condition are mentioned by Liveing and other writers on the subject. The distribution of the nervous energy which on running riot causes gastric crises or periodic vomit when directed in the manifestation of its abnormal force through the vasomotor system, will, on being conducted through another system of fibres, result in different manifestations. When, for instance, through the trophic nerves, defective nutrition will be the result; the same may be said of the manifestation of pain, etc.

SYMPTOMATOLOGY AND CLINICAL COURSE.—The manifestations of the disease generally present themselves without warning, and the suddenness of their appearance and departure are rather characteristic. Possibly the patient may complain for a short time before the appearance of the swelling of vague feelings of malaise, general disinclination to do anything, feeling of depression associated with ill-defined gastro-intestinal symptoms. The œdema comes on quickly, generally reaching its full development in a few hours, and gives the patient very little trouble except by its mere presence; there is a feeling of stiffness and unwieldiness and a sensation as if the parts were on the stretch—that is, it is not attended with pain or distressing throbbing or any of the subjective symptoms of inflammatory swelling. The swelling is generally clearly circumscribed and closely differentiated from the surrounding surface and of a varying color. In some cases, but probably not in the majority of them, the skin is of a dark-red, dull roseate hue, while in others the marked contrast between the pale, almost waxy, color of the swollen surface and the skin around it is very striking. This was very well marked in a case seen by Dr. Starr, in which, he says, the skin had a whitish-yellow tint without the natural color, which was good on the other side. It resembled almost exactly the condition seen in myxœdema, but the swelling did not produce the thick fold on the nose running up from the cheek so often seen in myxœdematous patients. The swelling has marked predilection for certain parts of the body, and these locations have already been cited under the heading of etiology. The swelling does not pit on pressure, or, if it does, but in a few cases and in these not to any marked extent, so that the indentation produced by forcible pressure of the finger is quickly effaced. The subjective symptoms sometimes complained of by the patients are a sense of scalding or burning as the swelling is showing itself, and probably due to the marked

tension under which the skin is suddenly placed, and after this generally a feeling of itchiness. Outside of these, if the swelling does not encroach on any organ, such as the eye, the stomach, the penis and testicles, or does not block up the conductivity of a passage, such as the mouth, the pharynx, the larynx, or the nasal passages, as it sometimes does, and so produce trouble, there will be hardly any other subjective symptoms complained of. The objective symptoms noticed have not been so constant in their occurrence as the others. Frequently the surface temperature of the swollen part has been found to be slightly elevated, while, on the other hand, carefully made observations have demonstrated that the specific heat of these parts was considerably lowered; this apparent discrepancy has, perhaps, arisen through different observers taking the temperature at different periods of an attack, for it is quite probable that at the beginning of an attack the surface temperature of the part is somewhat elevated, and later, or just before the swelling is going to wane, the temperature falls.

The swelling usually reaches its height in any one part in a few hours after its appearance, in some cases in a few minutes, while in others six to eight hours will elapse. Then, after remaining for a period of from a few hours to as many days, it will begin to disappear, ordinarily with a corresponding rapidity to that with which it showed itself, and frequently its disappearance from one part is the signal for its manifestation in another, which may have no relation to the part previously affected; for instance, it will jump from the forearm to the eyelids, or from the lips to the crest of the ilium, or from the cheeks to the stomach, or *vice versa*, that is to parts having no apparent anatomical or physiological connection. As a rule it does not show itself in more than two or three localities at one visitation, and frequently in only one. After its disappearance from an area a sort of "wooden" feeling in the part is complained of; that is, the patient feels as if the parts were somewhat heavy and numb, although the responses of the different sensations are unimpaired. The multiform appearance of the lesion is one of its prominent characteristics, and although, as has been said, it commonly disappears from one part before a second area is involved, it is not infrequent to find it in different parts of the body at the same time. The disease recurs, and in the analysis of the number of cases on which this paper is based the time between the attacks averaged nineteen days; some cases, of course, having three to four attacks within a month, while in one of Riehl's cases three distinct attacks showed themselves within fourteen days, while others go for three and four months, and even longer, before a recurrence, and occasionally there are even interruptions of some years' duration.

The symptoms of the disease when some of the mucous membranes are attacked are well marked and suggestive. As has been already said, the

mucous surface most often affected is that of the larynx and the stomach. Undoubtedly there are many who will take objection to having the symptoms of gastro-intestinal irritation, so common in many attacks of this disease, be made to be directly dependent upon an analogous condition of cedema in the mucous membrane of the stomach and intestine, but the evidence is so corroborative, and the symptoms point to this explanation with such directness, that I do not hesitate to include it under this heading. And besides, precedent from the most experienced writers on the subject is not wanting, for Quinke, Strubing, and others consider this to be the explanation of the symptoms referable to the gastro-intestinal canal.

Of the seventy-two cases, it has been said that three showed their initial symptoms to be located in the stomach, and in 34 per cent. of the entire number, gastro-intestinal symptoms were found to be sufficiently prominent to attract attention. This does not include cases of dyspnoea and attacks of vomiting from unknown causes that are found reported. It includes only those cases where the cedema showed itself, either at first or later on, on the surface of the body. The proportion of cases in which the mucous membrane of the throat was involved was considerably less, *i. e.*, about 21 per cent. Although the mucous membranes of these parts were somewhat involved in a greater number of cases than is stated here, this symptom was allowed to enter into the statistics only when it was of sufficient intensity to cause the patient to complain of it, and so become part of the natural history of the disease. The symptoms referable to the stomach are first a feeling of uneasiness and tension, as if something indigestible had been taken and had remained in the stomach, and with this there is loss of appetite, generally associated with constipation, which is soon followed by a distended appearance of the epigastrium, and then sharp colicky pain, attended with profuse vomiting and great thirst. This pain may be so severe, as Osler states, as to demand the administration of morphia. The character of the vomit depends at first upon the contents of the stomach, but later on it becomes watery and somewhat stringy from the mucus therein, and frequently profuse in quantity. When this continues for any length of time the thirst becomes greater, and large quantities of urine are frequently passed, which, however, contains nothing abnormal with the exception of increased quantities of earthy phosphates. The pain is frequently so great that it produces distressing restlessness and insomnia, and requires considerable quantities of anodyne before it can be subdued. After this symptom exacerbation has ceased, the reaction sets in, and there is frequently a diarrhoea of a colliquative nature, with an apparent retraction of the abdomen and a general feeling of lassitude and prostration, and the disease symptom shows itself in another part of the body, or if it has already done so it now begins to disappear.

It would be very unfortunate if one, from reading this, should imagine that all these symptoms are an absolutely necessary part of the history of the disease, or that when they do occur they are by any means necessarily so severe as has been stated. In the majority of cases the gastrointestinal symptoms are rather moderate, and do not require any special means directed toward their relief.

When the swelling appears in the larynx it of course produces symptoms in proportion to the amount of encroachment that it makes. This is often so great that distressing symptoms of suffocation are produced, and indeed in some instances, in consequence of the œdema, death has taken place, as in two of the cases reported by Osler, and in several others the symptoms became so urgent as to demand severe scarification and, more rarely, tracheotomy. As a rule, the swelling does not pass by any continuity from the pharynx into the larynx, but when it is to attack the latter it shows itself with the same degree of abruptness and vigor there as it does in other parts of the body, and as a consequence the horrible sensation of choking to death coming on with such rapidity has added to it a condition of mental distress which is terrible even to witness. Such cases are reported by many different writers, such as Strubing, Milton, Quincke, and others.

Difficulty in swallowing when the seat of the swelling is in the pharynx is not so common nor does it ever become so distressing as does the corresponding symptom in the larynx. However, Cuntz, Riehl, and Goltz have reported cases in which this symptom was of considerable severity, but of course the dyspnœa in these cases never became greatly aggravated.

Often these symptoms, referable to the seat of the lesion in three different parts of the body, viz., the stomach, the skin, and the pharynx or larynx, come on consecutively or are present together, and an excellent example of this was observed by Jeanneret and Quincke in the person of a young skilled mechanic who had periodical attacks on Fridays, Saturdays, and Sundays. From his first to his seventh year he was troubled with periodic attacks of colic, loss of appetite, vomiting, thirst, constipation, and afterward diarrhœa. From his seventh to his fourteenth year he remained entirely free; then, in addition to the above symptoms, he began to have areas of circumscribed œdema appear, especially on the left side of the body, such as the hand, elbow, fingers, phalanges, and later in the knee, foot, and toes, and then afterward it showed itself on the face. After a few years there was added to this clinical picture symptoms of swelling of the laryngeal mucous membrane, increased secretion of mucus, and evidences of suffocation in the highest degree, and cyanosis was extreme. Dysphagia, however, was not troublesome.

Of the general health between the attacks, little is to be said. Gen-

erally there is nothing noticeably wrong; for a day or two after an attack there may be a feeling of slight prostration, especially if the disease symptom has attacked at all the gastric or intestinal mucous membrane, but this soon passes away and the condition of the body is excellent until the next attack shows itself. And frequently there is not even this feeling of lassitude. In one of the cases that I report the attack would come on in the night, be found in the morning, and on the following day it had disappeared and the patient went to her business undisturbed, as if nothing had happened.

It has long been thought that the disease known as *urticaria tuberosa* or giant *urticaria* is similar to *angio-neurotic œdema*, and although some physicians are not entirely ready to admit this, still it cannot be denied that the two diseases—if two there be—are so nearly alike in point of development, distribution, course and appearance that it is barely possible to detect any difference, and it is quite probable that we must all admit with Osler that the disease has certain remarkable affinities with *urticaria*, the giant form of which is probably the same thing. *Urticaria tuberosa* is admittedly a variety of ordinary *urticaria* in which the lesions are larger, but it has a similar causation and pathology. It occurs on various parts of the body, and an experienced dermatologist of this city tells me that he has seen it on the lips, the ears, and the eyelids, and on the extremities. The affected parts swell rapidly, become red, and sometimes somewhat red around the periphery with a white centre, on account of which it received the name "*urticaria porcellana seu alba*;" the swelling may vary in size from a walnut to a turkey-egg, lasts for a few hours and then disappears, leaving the patient weak, languid, and sore. It recurs frequently in the same patient and at somewhat regular intervals, and generally without apparent cause. A friend of mine has a patient at present who is supposed to be suffering from *urticaria tuberosa* whose prepuce swells up rapidly and extremely after each sexual intercourse. The lesion of *urticaria* is supposed to be in the bloodvessels and incident to some vasomotor disturbance, and especially in the vessels of the corium, no change taking place in the epidermis except nutritional changes purely secondary to the vascular disturbance. It is thought that previous to the dilatation of the vessels in *urticaria* there is a transitory contraction, but this is not susceptible of proof, and it probably occurred to the first would-be explainer to suggest this on the analogy of the supposed like phenomena thought to take place in inflammation. It has been raised as a point of objection that they are dissimilar in the fact that *urticaria* is attended by considerable itching, while *angio-neurotic œdema* is not; but this is not a fact, for there is no dearth of observation to show that the latter is frequently attended with a sense of itching. Juler, Jamieson, and Milton have all recorded cases

of this variety of urticaria, which few now deny the right of being included under the head of angeio-neurotic œdema.

Another disease which has a symptomatology very similar to the disease in question is a variety of purpura, characterized by purpura, gastro-intestinal troubles and circumscribed cutaneous œdema, coming on generally with considerable intensity, without apparent cause, very abruptly, and not infrequently associated with marked intestinal symptoms. Couty has recorded a case in which the symptoms came on with very violent colic and atrociously painful retraction of the abdomen, associated with vomiting and constipation and soon followed by epistaxis and the appearance of periarticular œdema. In the interval between the attacks the appetite was good, no indigestion or pain, and the patient felt all right. Curtis has also recorded the case of a young man who four years previous to the attack for which he then presented himself had an attack of purpura which nearly proved fatal, so severe was it. Before his admittance into the hospital for the last attack he was troubled for about two days with a swelling on the right cheek about the size of an orange, no pain, some oozing of blood into the mouth, and general prostration; the temperature and pulse-rate somewhat increased, respirations labored and dyspnœic. The swelling was pale except for a few hæmorrhagic spots in the centre, pitted slightly on pressure, but was not painful, tender, or hot.

Ollivier, Vernier, Rilliet, and Borthiez in France, Willan and others in England, and Holmes in this country, have reported cases all going to show the neuropathic origin of this variety of purpura and incidentally to demonstrate its close relationship to angeio-neurotic œdema. These cases occur irregularly, without fixed intervals, disappear after a short time, are not modified by the general state, and are apparently dependent for their manifestation on some trouble with the sympathetic nerve system.

It would seem quite plausible to believe that these conditions are but members of the same family manifesting themselves through the vasomotor nerves, and depending for the slight differences which are sometimes noticeable, on the diathesis of the patient, and the difference in the resistibility of different people, as we see in other conditions where frequently the same causative factor will give rise to different manifestations.

DIAGNOSIS.—The diagnosis of a case of angeio-neurotic œdema will be attended with little or no difficulty if it be made by a process of exclusion. The visceral organs being found healthy and functioning properly, then the source of the œdema must be sought for in the blood-vessels, and if it occurs with the characteristics already mentioned of angeio-neurotic œdema, it cannot be mistaken for œdema dependent on any other cause, excluding of course those mentioned which have been concluded to be the same or an analogous condition. A disease of the

Antipodes known as Australian blight might be mistaken for it ; but as this condition is confined to the locality indicated by its name, and as it is not at all improbable that it will be found on further study to be a very similar disease, it therefore does not require any special consideration.

That it may be confounded with the blue œdema of hysteria, as described by Sydenham, or the white œdematous swellings occurring with the same disease, as described by Charcot, is barely possible in some instances. In hysteria, however, and especially if the hysterical attack is sufficiently profound to have œdema as one of its attendants, there will always be found the well-known stigmata which will be sufficient to make the diagnosis. Other factors, such as the abruptness of onset and the mode of departure as well as the distribution of angeio-neurotic œdema will corroborate the diagnosis.

DURATION AND PROGNOSIS.—The duration of the disease varies from a sufficient period to have one attack to a lifetime. The statistics bearing on prognosis do not allow us to draw conclusions that are of any great value. From the very nature of the disease and its obstinate unamenability to treatment, these patients do not remain sufficiently long with any one physician to permit him to observe its entire course. They vacillate from one Mecca to another, remaining with each only long enough to exhaust their credulity in the one who is so rash as to promise them good tidings from treatment. As a result, many of the writers in reporting their cases are unable to speak of the eventual results or disposition of their patients' maladies, but from what evidence we have I think it justifiable to say that the disease disappears after lasting a variable time of from two to three years in about one-half the instances. In the other half it may remain dormant for prolonged periods, but you can never prognosticate when or where it is going to manifest itself, while in others of this remaining half it continues to recur at varying intervals during the patient's entire life, which may not, however, be apparently shortened by the exhibition of these attacks. In some patients the manifestations cease to present themselves when the exciting cause can be obviated, such, for instance, as in case No. III. of the following series, and likewise when they appear after slight traumatisms. It rarely causes death, and then almost alone by involvement of the larynx and consequent suffocation. In the entire number of cases analyzed, in three only, and possibly four, could this result be said to have happened. Whether or not the possession of this infirmity tends to shorten life by predisposing to other conditions which destroy the life of the patient nothing definite has been observed, and there must necessarily be a greater number of observations before any justifiable conclusions could be drawn in this respect.

Osler's series admirably demonstrates the fact that the possession of

the disease from earliest childhood does not necessarily shorten life, for one of his cases shows that the first attack came on in the patient's eighteenth year and lasted until his ninetieth, and in another case the attacks began at the age of five years, and the patient was still having them at fifty. Strubing also records a case beginning in the twenty-fifth year of the patient's life and the attacks had not ceased at seventy; this patient, besides, often had the most distressing attacks of laryngeal implication, during which death seemed at every moment about to take place from suffocation, but they would suddenly pass off. The prognosis, as regards cure from the intervention of the physician or from therapy, is entirely unfavorable.

TREATMENT.—We must here confess our inability to cope with the progress of the disease. So far, therapeutic measures have been of but little avail, either in mitigating the length or the severity of the attacks or in increasing the interval between their recurrence. Golden rules as regards striving to place the systems of the body in the best possible condition are as pertinent here as in all other conditions where there is evidence of constitutional depravity. As an all-around vasomotor and general tonic to the muscular system of the body, strychnia most nearly reaches the mark. It should be given in large doses and until its full physiological effects are manifest, particularly on the spinal cord, for although the affection is one indicating defect of the sympathetic nervous system, we must not forget that the origin of that system is in close generic relation with the spinal cord. In one of Starr's cases massage seemed to be productive of considerable benefit in making the attacks less frequent insomuch as in a patient who was having attacks quite frequently six months elapsed with only one outbreak. In two other cases observed by him its administration was of no service. In one of Quincke's cases the patient went two years without a recurrence of the symptoms after taking a water cure at Kissingen. But further endeavors at other baths did not cure the disease. Elliot thinks he got some beneficial results in a case treated by him, with a mixture of cascara sagrada and nux vomica. Hartzell is of the opinion that saline laxatives every morning and small doses of sodium salicylate seemed to diminish the severity of the attacks, while the symptoms in Matas' case succumbed to large and repeated doses of arsenic. In one of the cases reported by Lovett benefit was derived from the use of compression by means of a Gamgee dressing, and very favorable results seemed to follow the administration of atropine in one of Dinkelacker's cases, the doses being large. In some cases the application of warmth, preferably dry, is followed by a more rapid subsidence of the attack than would otherwise be, and Milton derived very encouraging results from placing one of his patients on such a "shotgun" prescription as a mixture of iron and arsenic alternating with doses of the acetic extract of

colchicum and occasionally a blue pill, not forgetting a steam bath once or twice a week, and strict scrutiny of the diet. But the consensus of opinion amongst those who have treated this affection is that arsenic, iron, the bromides and the iodides, ergot, atropine, electricity whether faradism or galvanism, or anything else that has been suggested, is of very little use, and that when the physician has placed the general health of the patient in the best possible condition he can do but little more in furthering the cure of the disease.

Accidents are to be looked out for and avoided, if possible, and those factors bearing a causative relation to the disease eliminated as far as possible.

Before saying a few words concerning the probable pathology of the condition it is well to append the following clinical histories :

CASE I.—Miss F., aged twenty-six years. The patient was seen for the first time in October, 1888. She was a well-nourished girl, born of healthy parents, and had not been ill since her childhood, when she had some of the exanthemata. About a year ago she began to be troubled with indigestion, which was at times very distressing and for which she sought treatment, but with very little good resulting. These attacks of dyspepsia would come on suddenly without premonition, and were manifested by a feeling of pain, distress, a general feeling of malaise, and a sense of tension in the stomach with loss of appetite, which lasted for two or three days and then passed off. About this time, she cannot say exactly when, that is whether it was previous to this so-called dyspepsia or following it, she awakened one morning to find a circumscribed swelling on the left cheek, hard to the touch, well marked from the surrounding parts, not painful but heavy and stiff, and about as large as a small peach. She gave very little attention to it, thinking that she had been stung by a bee or bitten by something, and was surprised that it did not pain. Cold applications were made, and in the morning it had disappeared. No more was thought of it until about six weeks later, when it recurred with as little warning as before and accompanied again with an exacerbation of the stomachic symptoms. It subsided in about twenty-four hours and as suddenly as it had appeared. When the third attack came on I was sent for at once, so that the swelling was seen about at its maximum. The swelling was on the left cheek and about the same as described above; the color was a trifle paler than the surrounding parts; it was resistant to the touch and did not pit on pressure, and seemed to give no trouble except by its mere presence. On inquiry it was found that the appearance of the swelling had no apparent connection with the advent of her menstrual period, and this with all the other functions of the body seemed to be performed properly, with the exception of the digestion as already spoken of. The urine was tested for albumin and sugar, but with negative results. No cause could be attributed for these attacks; they always came on at night and as far as she knew toward the early morning, and the temperature of her sleeping apartment was not materially different from that of the rest of the house. The attacks continued to present themselves for about a year, at an interval of from five to six weeks, always in the same locality at the beginning, but frequently attacking the other cheek and

forehead, then after a respite of four or five months, when we had begun to flatter ourselves that the treatment was beginning to be beneficial, another attack came on in the face, which subsided at the usual time, but on its disappearance the right upper lip became involved to such an extent that it was impossible for her to open it for a day. After this it was the ordinary occurrence for the cheeks and eyelids to alternately be the seat of the manifestation or for it to follow from one of these places to the other.

At first it was attempted to treat these swellings by the aid of cold water and compression, but the length of their duration or the tendency to repetition was not shortened one whit. Then strychnine and hydrochloric acid were given a long and generous trial, as were also many other drugs which we know physiologically to have a vaso-tonic effect, but each succeeding one was more disappointing than the other, until the patient despaired of any relief, and trace of her was lost.

CASE II.—W. H., aged thirty-four years, barber. For four years he has been troubled with periodic swellings of the left hand (inner side) and the forehead. He thought the affection of the hand had a relation to his occupation, until the swelling appeared on his forehead. He has never had rheumatism, syphilis, or severe illness, with the exception of inflammation of the lungs many years ago. As far as he knows his family history is good; does not know from what disease his parents died, but thinks his father had a stroke of paralysis. He cannot say exactly how the first attack came on, as he thought it was a slight touch of rheumatism, and he gave very little attention to its going or coming. It was only after several appearances of it on the hands that it showed itself on the forehead. There are no premonitory signs to warn him of a coming attack, only what he calls a feeling that he knows it is coming, and although I have many times tried to determine whether it could be proved to be influenced by the mind or will, such as instructing him to fix his attention wholly on that part of the hand where the swelling usually appears, or trying to anticipate the advent of the swelling, it was attended with no results, as was likewise his endeavoring to keep his mind occupied and to forget it. He was sure that it had frequently been brought on by striking his hand, and he is positive that an attack came on once directly after catching at a game of base-ball. The attacks are more frequent and troublesome in winter, and take longer to subside unless he remains continually in a very warm room. There is no periodicity about the attacks, nor do they occur with any regularity; sometimes he will have three in a month, and then again he will go two months without an attack. His general health is excellent, and no trouble with any individual parts; there is no particular time in the day or night when the attacks show themselves. The swellings are wooden to the touch, do not pit on pressure, neither subjective nor objective sense of throbbing, and attended with no pain unless he should place his hand in cold water, when there is a sharp sense of burning. The attacks usually begin in the hand and last for a few hours, and then show themselves on the forehead, and once or twice he says the side of his neck became swollen, but no symptoms of laryngeal involvement were ever manifest. The treatment which seemed to be most serviceable in this case, if service indeed it can be called, was bromide of potassium, as this seemed to lessen the intervals and the severity of the attacks.

CASE III.—The notes of this case are rather meagre, and I am not

certain that it should be included under this heading at all, but no other possible explanation could be suggested. C. T., a physician, aged forty years; personal and family history excellent. No neurosis inherited or acquired. During the winter of 1889 and 1890 the first attack presented itself in the shape of a swelling about the size of a one-cent piece over the centre of the forehead, and it came on, as did the following attacks, after close mental application and fatigue. The swelling was so great as to prevent the wearing of a hat, and generally lasted a day or so, sometimes only a few hours. Although the œdematous manifestations were always on the forehead, they did not recur in the same area; for instance, the first one was over the region of the frontal sinus, while the next succeeding attack was toward the left frontal eminence, and so on. His general health was, as far as could be determined, without a flaw. He had in all about ten to fifteen attacks at variable intervals, when, becoming cognizant of the part mental fatigue was playing in their production, he obviated that, and the attacks did not recur, the treatment that he had meanwhile been subjected to availing him nothing.

The history of the case about to be related is a very interesting one, and has been seen by a goodly number of physicians for diagnosis and treatment, and I hope it will be understood by those gentlemen who have seen the case that I am not flying in the face of their diagnostic ability or acumen when I place it under the heading of angio-neurotic œdema, or urticaria tuberosa. I do it as the result of a process of exclusion, and not that I am at all sure that it really belongs here. That I must leave to the opinion of my auditors.

CASE IV.—X., a physician, aged forty-one years, has been troubled for now approaching four years with a periodic swelling of the scrotum, which is intensely distressing and confines him to the recumbent posture for some days. Up to the time of his first attack his health had been excellent, and he has no knowledge of such an affection having existed in any of his relatives, or in fact any particular nervous disease. At the time when the first attack appeared his health was in as good condition as ordinarily, and no cause whatever could be attributed for the appearance of the disease, which was ushered in by an intense painless swelling of the scrotum, without any premonitory symptoms. The œdema increased rapidly, until it became almost as large as a man's head, then he would have a series of successive rigors, which continued about an hour, and were then followed by a moderate elevation of temperature, say a degree or two; once it went higher, to 102° F., with a very aggravating headache, which persisted for some hours and then disappeared. The scrotum during an attack is rather reddened, not painful either on handling or spontaneously, but is accompanied by a burning, smarting, itching feeling, and a profound sensation of tension. The attacks come on abruptly, last a variable period of from a few hours to as many days, and terminate without leaving any sequences except a feeling that he has been rather knocked up. After the first few attacks the scrotum exfoliated, and particularly after such as were of long duration. No other part of the body has been affected. Formerly the attacks recurred every few months, but now it is not uncommon for him to have several months go by without his entertaining a visitation.

It has no apparent relation to trauma, but the scrotum is very sensitive to the action of cold, especially cold water, and will immediately begin to swell when placed in the latter. At first the patient thought that it might in some way be kept up or aggravated by his use of tobacco, which had been rather extensive, but this habit was broken off for nearly three years without having the least influence on the disease. Again, it has most often been diagnosticated as "gouty," but the careful abstention from wine and spirituous liquors and a strict regulation of his diet does not in any way influence the attacks; nor when these things are taken as he has been accustomed to using them are the attacks in any appreciable way hastened or precipitated. And, furthermore, colchicum and the salts and water of lithium, the specifics in gout and its latent manifestations, do not in any way affect the continuance or recurrence of the disease, and they have been given a most flattering trial. The attacks always come on in the night, and generally he is awakened toward morning by the sensation of burning in the scrotum. With the exception of nausea and sometimes vomiting at the beginning of an attack, he has never had any symptoms which would call one's attention especially to the alimentary canal, but sometimes he has a considerable pain in this region, and, having a rather weak digestion naturally, one is not surprised that this debility is exaggerated during an attack. The last one that the patient suffered was very much milder in its course and shorter in its duration than any previous attack, although sufficiently severe to make the patient keep the recumbent posture for a couple of days, and recently this gentleman has had an attack manifested entirely by local symptoms, and no constitutional conditions whatever. Of all the therapeutic measures tried none have given any relief, unless one might say that the patient was made more comfortable by the use of external warmth.

Before considering the scanty evidence which we are in possession of in reference to the pathology of angio-neurotic œdema it will be well to devote a moment to the citation of those affections which are likewise attended with an œdema having many of the clinical characteristics of the one in question. This has been explicitly treated of by Weill, and to him I must acknowledge a special indebtedness.

It is a familiar fact that there are a large number of diseases of the central and peripheral nervous system, as well as others which are not so clearly dependent on a lesion of these structures, that have associated with them as a prominent symptom an œdema marked by some particular clinical peculiarities resembling angio-neurotic œdema, such as abruptness of onset, rapidity with which it reaches complete development, resistant to the touch, accompanied by very little pain and tenderness, but having, however, a distressing burning and tightness due to the abrupt tension made upon the parts before it can in any way become even partially reconciled to its new surroundings, the color varying from a dark red to a pale lustreless almost waxy appearance, and lasting a variable time, but ordinarily characterized by the abruptness of its departure. Such an œdema is found occurring often in diseases of the

peripheral nerves, as in multiple neuritis and especially the infectious varieties, in isolated neuritis, and accompanying the paralysis of single areas dependent on the injury of a nerve. Many good examples of the latter were observed by Dr. Weir Mitchell during the late war, and treated of in his book on *Injuries of the Nerves*. They are likewise frequently found in diseases of the spinal cord, of which locomotor ataxia is the best example. And, as has been said before, the œdemas in these cases confine themselves exclusively to the location where the lightning-like pains have been or are most severe, and are frequently followed by arthropathic manifestations. Charcot and his pupils have published many cases wherein these facts have been especially noticed. In lesions of the brain, such as hemorrhage, embolism and thrombosis, and other lesions affecting the projection of the pyramidal tracts, a similar œdema is often to be found. In certain diseases which have been considered until lately, and by many even yet, to be dependent for their being upon some dyscrasiæ, such an œdema is to be found. Of these we may mention diabetes, rheumatoid arthritis, rheumatism, gout, the latter two mentioned not coming so clearly under this heading, as in most cases the œdema is probably largely dependent on a condition of nutritive change in the blood which favors the transudation of its watery elements.

Then there is the œdema which comes on in cases poisoned from carbonic oxide gas, which is largely a vasomotor trouble, caused by the action of the toxic substance on the nervous system, an opinion long ago suggested by Leudet.

There are likewise a number of functional diseases, such as hysteria for example, in which the development of œdema is not uncommon, and in cases where powerful impressions have been made on the nervous system, as in hypnotic séances, for instance; in some therapeutic procedures also, such as stretching a nerve for intractable neuralgia. An illustration of this has been given by Liveing, where this procedure was done for tic douloureux, and the patient very shortly after developed an œdema of the eyelid and a slighter attack on the side of the face corresponding to the side operated on. And even where lesions of this nerve occur, there will sometimes be found an attack of œdema among the many symptoms arising after such a disease or injury.

These facts are cited to prove that there are a number of diseases wholly unlike as regards the seat and structure of the lesion, which are accompanied by a symptom the explanation of which is impossible on any other ground than placing the disturbance on which it is dependent somewhere in the nervous system. And a point on which we wish to lay special emphasis is that this location is not limited to the sympathetic system; it may be and is manifested through this system, but the impulse which is propagated through this tract may have its starting-point anywhere in the entire projection of the nervous system, even to

the finest division. Take, for instance, in the case where Strubing was enabled to bring on an attack of œdema at will by slight traumatisms, such as slight tappings, or where an attack was sure to present itself, in another writer's case, whenever certain parts of the body were exposed to cold, or where it showed itself after catching in a game of hand-ball. These cases, which were of course predisposed subjects, had for the starting-point of an attack the slight traumatism applied to the peripheral nerves, which was conveyed to centres, and in turn transmitted through the sympathetic to the smaller blood-vessels and lymphatics, where its influence became manifested.

Until we are in possession of more definite and critical knowledge concerning the vasomotor nerves, in regard to the influences operative through them and the means by which they are incited and controlled, it is impossible to approach the discussion of the pathology of this subject with any great degree of satisfaction or certainty.

The three important questions which one finds held up for solution in the beginning are: 1. What is the nature of the lesion *per se*? 2. Where is the exact seat of the lesion? and, 3. Is it manifest through the arterioles, the veins, or the lymphatics? The first would include the underlying factors necessary for the production of such a symptom, a consideration of the location of such factors, and especially an inquiry into our present knowledge of the vasomotor nerves. Under the second it is necessary to determine whether the œdema confines itself to the dermal tissues entirely, or whether it includes the subdermal as well, and if there are any changes in the epidermis except those of a secondary nature which occur only occasionally and are dependent on disturbance of nutrition. And the last, the most important of them all, and unfortunately the one on which the least light can be thrown, is the question as to which of the vessels supplied by the vasomotor nerves is at fault in this disease.

The nature of the lesion is unquestionably that of a non-inflammatory œdema circumscribed in nature. The fact that the epidermis is not involved is an important corroborative fact, even if it was not so evident clinically that the œdema is not in any way connected with an inflammatory condition. The seat of the œdema is probably most often in the connective tissue of the derma, beneath the papillæ, and in the subdermal tissue; not but what it may and sometimes does remain confined to the more superficial parts, but as a rule we are inclined to believe that the truth of the first statement is sustained. This receives much clinical evidence when a close analysis is made of some of the symptoms. Take, for instance, the color of the œdematous swelling; in many cases it is found to be that of a dark lustreless rose-red, while in others, the paleness is one of the striking factors. In order to understand this it is necessary that we keep in mind the manner in which the bloodvessels are

distributed to the skin. They are arranged in two sets, one passing to the papillæ of the true skin, and the other dipping through the derma to the subdermal tissues, and distributed in three different sets—one going to the hair follicle, another to the sebaceous glands, and the third to the sweat glands. Now both these systems are under the control of the vasomotor nerves, and if the superficial set be involved in the angioneurotic œdema, it is very apparent that if there be any dilatation of the bloodvessels the result will be a varying red color of the skin. On the other hand, if the deep-seated set of vessels be at fault the surface of the skin will not have its color materially interfered with, so long, at least, as the œdema does not interfere with the circulation in the superficial set of vessels. When it does we may find an œdematous area which has previously been colorless, become reddish and even in some cases rather mottled. Then the œdema in this condition, as a rule, does not pit much on pressure, and in cases where the impress of the finger remains, this impression is very evanescent, a condition quite the reverse of what takes place when the œdema involves the most superficial parts. This œdema is also, as a rule, a painless affair, which it would not be if the superficial parts of the integument were involved, where the sensory nerves have their greatest ramification and distribution.

Most writers are of the opinion that the vasomotor system is at fault in the causation of the œdema, but a little consideration will show that this in itself is not sufficient to explain the matter entirely. The vasomotor system, derived mostly from the sympathetic, has for its function the regulation of the calibre of the arterioles, the veins, and the lymphatics. Like the system of which it is a part, it has its origin in the cerebro-spinal nervous system, and is of double nature, that is both as regards its centres and its nerves, viz.: vasomotor centres and nerves, and vaso-constrictor centres and nerves. The chief centre, situated in the medulla, is assisted in the performance of its functions by at least two sets of subsidiary centres, located respectively in the cord and at the periphery where the nerves are distributed; this latter is clearly demonstrated by dividing the cervical sympathetic in a rabbit, which will result in a severing of the connections between the parts and the central or sympathetic system, and the vaso-constrictor influence being abolished the vessels will dilate and a swelling result in the ear of the corresponding side; but after a short period the ear will gradually return to its normal condition and the integrity of the circulation becomes restored, which shows that centres secondary in importance to central ones, although at first overwhelmed when the sympathetic is severed, soon recover their ability to bring the vessels back to their proper calibre. All the centres are under the influence of cortical areas, which may not be thoroughly and definitely localized, but their influence is proven by a quantity of familiar evidence, as for example, the everyday

phenomenon of blushing, caused by even a mere thought, or dependent upon other factors acting primarily on the cortex. The vasomotor fibres are far better understood than the vaso-dilator fibres, as the former's activity may be manifest either in dilation or contraction, and the latter's only by dilation of the vessels of a given area. Landon gave it as his opinion that the swelling in angeio-neurotic œdema was due to the fact that there was a spinal irritation, arising from chilling, which leads to paralysis of the sympathetic, and particularly of those branches which supply the smallest arterial vessels, thus destroying their tone. If the previous statement as regards the sympathetic be true, it will be readily seen that this theory of Landon's is insufficient. If the manifestation of the spinal irritation is assumed to be through the vaso-dilators alone, then the explanation would be more apparent. In Ostromouf's experiment, where the lingual nerve of a dog was divided, and an œdema in a half of the tongue was produced on stimulation of the peripheral end of the divided nerve by the induced current, it is quite as easy to believe that the vaso-dilators had been stimulated to activity as to see the inhibitory activity of the vaso-contractors brought into activity by the stimulation of the current, and as it has been proven experimentally that the manifestations of the activity of the vaso-dilators is generally localized, it would seem most plausible to explain the œdema in this experiment along this channel. Vulpian has demonstrated in a similar experiment that long continuance of the irritation and the œdema results in changes in the arterioles, so that a predilection for recurrence of the œdema may have something to do with this fact. Ranvier's classic experiment, which has been corroborated with some restrictions by Hehn, Rott, and others, would seem to demonstrate conclusively that the nervous system was all-important in the production of œdema. He made experiments by tying such important veins as the femoral, the jugular, etc., without producing œdema; but if the inferior cava was tied and the nervus ischiadicus cut, then the œdema would promptly appear on the side where the nerve was severed, and not on the other side. This would seem to show that so long as the nervous mechanism remained intact that œdema does not come on. Goltz, in some experiments made in 1863, showed that in a frog with a ligature of the aorta, the veins of the abdominal viscera filled with blood from below upward after having been struck a few slight blows, and in a healthy frog this disappeared when this ligature was removed. In a frog which had the spinal and cerebral connections destroyed the resulting œdema would not disappear after the ligature was removed from the aorta, showing, of course, that the œdema was influenced in its appearance in the first frog by the intactness of the cerebro-spinal system, and did not disappear in the second, because the vaso-constrictor influences which should have been sent to the veins was interrupted in

its conduction. This view would incline one to the belief that the veins were the principal medium in which the œdema took place, and, although there has been much experimental evidence to partially corroborate this view, to-day it has not many advocates who are willing to aver that it is the sole means by which œdema takes place. Klemensiewicz is of the opinion that we are to look to the lymph vessels and the changes in lymph circulation for the explanation of œdema. But until more extensive knowledge is had of the plan of their distribution and inter-relationship, and especially the relation of lymph supply and circulation to the vascular circulation, it is useless to speculate on its relation to œdema. One fact, however, would seem to be strongly antagonistic to the acceptance of Klemensiewicz's suggestion, namely, that when pressure is increased in the arterial capillaries lymph is produced or secreted, while a like condition in the veins is attended by an absorption of the lymph, and we know that abolition of the lymph stream in the lymph vessels of the skin is not followed by œdema, as most of the lymph returns normally through the veins of the skin to the heart. Therefore, in order to have an œdema for which the lymph stream and vessels should be held accountable, it would be necessary to have a diminution of pressure in the arterial radicles and an increase in the venous, a state of affairs which is rather paradoxical. So, apparently, no conclusions can be drawn which would justify us in giving to the arterioles, or to the veins, or to the lymphatics alone, the first place in the manifestation of this œdema.

CONCLUSIONS.—The conclusions concerning the pathology of this disease which can as yet be warrantably drawn, are:

1. That there exists a variety of œdema attended by such striking characteristics of its own that we are justified in referring its origin to the nervous system.

2. The seat of the manifestation of the lesion is probably in those vessels and lymphatics which pass through the corium to the subdermal tissues.

3. It is probable that although the lesions or the irritants on which the disease is dependent may attack other parts of the system, yet the result directly appears through the sympathetic system.

4. Evidence concerning the bearing of trophic influences in the production of the disease cannot be produced. But when trophic changes do occur they are more plausibly attributed to the changes brought about by the oft-recurring œdema, *per se*, than to influences exerted through the nervous system as true tropho-neuroses.

5. It is quite possible to believe that in the future its causation may be attributed and shown to be dependent upon products manufactured and ordinarily disposed of within the system, but which, acted on by sinister influences, either inherited or acquired, result in the temporary

disturbance of the vasomotor system, which is manifested in various parts of the body, depending, as does the analogous condition of the distribution of blushing and flushing, upon structural peculiarities, either central or peripheral, or upon inherent predilections.

6. This condition has a close relationship to the many œdemas spoken of, and also a family relation with many of the arthropathies as yet not well understood, but known to be directly caused through the agency of the nervous system.

7. It must be admitted, from clinical evidence, that the affection in question has a family relation with other vasomotor neuroses, such as exophthalmic goitre and urticaria.

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SUTURE OF THE PATELLA AFTER FRACTURE.

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My experience with the operative treatment of fracture of the patella has not been a large one, favorable as it is, yet it may deserve recording as an encouragement to others. Let me say, however, that I do not subject every case of broken knee-pan to operative treatment. Before resolving upon this course I must have a patient in favorable general condition, preferably young, with decided separation of fragments, not averse to an operation, willing to abide its consequences, and lastly, favorably situated hygienically. This last clause means—for me—having the patient in the hospital, where alone I can be sure of my assistants and surroundings.

Patients are advised, under these circumstances, to submit to operation for two reasons: 1. The results are better, *i. e.*, bony union is positively obtained, while perfect motility of the joint is more probable; and, 2. The time necessary for recovery is usually halved.

These considerations, coupled with confidence in the operator, are ample for the majority of patients to whom such advice should be given, and are amply justified by even eleven cases such as those reported below, all of which, save one, were operated on at the General Hospital.

CASE I.—A. S., aged twenty years. May 31, 1885, fell and broke his right patella transversely about the middle. The limb was kept on the

single inclined plane for some weeks, and he left the hospital with a very good fibrous union of the fragments, with slight separation. October 4, 1885, he tripped, and thereby widely separated the fragments and became at once disabled. On admission to the hospital, two hours later, the patellar fragments were found three centimetres apart. The limb was dressed temporarily on the inclined plane, with applications about the joint to promote absorption of the effusion. October 28th, he was anæsthetized, the joint opened under the Lister spray, which was then in use, by a single longitudinal incision. The patellar margins were relieved of their fibrous material by exsection of the ligamentous portion, and were then drilled twice and two silver-wire sutures were introduced, the fragments being snugly apposed. November 12th, the limb was removed from the splints and allowed to rest on a pillow, and passive motion was made. November 25th, the patient was given nitrous oxide gas, and some slight adhesions in the joint were broken up under this anæsthetic. December 8th, he was walking without crutches, and when last seen, September, 1886, he was employed in setting up pins in a bowling alley, with motion in the joint as free as it ever had been.

CASE II.—E. F. H., aged twenty-two years. October 26, 1886, patient slipped on a level floor, and in an endeavor to save himself fractured his left patella by muscular effort. He was attended by Dr. Niemand, who sent him to the hospital the next day. The fracture was at a line adjoining the upper and middle thirds. There was not much joint effusion. Four days later, in clinic, the patella was wired under the spray. Counter-opening was resorted to on each side of the joint, and bone drainage-tubes were inserted. I found the lower fragment turned in, with its fractured surface toward the joint cavity, so that bony union would have been quite out of the question. The surfaces were freshened and evened by means of a saw attached to a surgical engine. Two silver wires were used. Four weeks later the dressings were removed for the first time. The result was perfect. December 7th, the patient was *discharged*, able at that time to bend the knee to a right angle, with every prospect of perfect function. On the *following* day, while walking on a slippery pavement, without crutch or cane, he slipped, fell, and injured the same knee again. He was taken at once to the hospital. On his admission the knee was found to be so distended by effusion that nothing definite could be made out, save loss of function. Two days later it was made plain that a re-fracture had occurred. The swelling had largely subsided under applications of ice. On the following day the previous operation was repeated. I found the old line of union severed; one of the silver sutures had broken, the other had been pulled completely through the bone. The joint cavity was full of clotted and fluid blood. Silver sutures and bone drainage-tubes were again resorted to with the same antiseptic precautions. The joint healed as kindly as before, but without the same satisfactory result. On removal of the dressings, several weeks later, it was found nearly stiff, and during the ensuing months at home the patient lost what little motion he had when he left the hospital, and he has, to-day, a perfectly stiff, though otherwise useful leg.

CASE III.—R. B., aged twenty-two years. December 30, 1886, this patient fell in a slippery barn, striking his right knee against the shaft of a sleigh. He was removed at once to the hospital. Upon admission, a transverse fracture of the patella was found at nearly its middle. As the swelling from the effusion was considerable, the limb was placed

temporarily upon an inclined plane, and hot applications were made for several days. January 5, 1887, operation was performed in clinic, the incision being transverse. It was performed, without incident or accident, in the conventional way, two large silver sutures being used, and the twisted ends being turned down between the fragments. Drainage-tubes of bone were used. The dressing was not changed for several weeks. This patient went home in seven weeks from the date of the operation with a knee at that time already quite flexible, and within three months he could bend the limb as well as he could the other. Unless one saw the scar he could not tell which of the knees had been operated upon.

CASE IV.—A. K., aged thirty-four years. January 10, 1888, while straining in lifting and pushing a heavy object, he struck his left knee and was at once disabled. Within ten minutes I saw him and sent him immediately to the hospital. He was a man of large frame and very muscular. Effusion was rapid and excessive. There was no difficulty in making out a transverse fracture of the patella. Four days later, after applications of ice had been made, it was seen that there was ecchymosis extending down almost to the heel and up to the pelvis. Operation was performed in clinic, and the joint cavity was found full of blood-clot. There had also been extensive separation of skin from the underlying tissues all around the joint, except in the popliteal space. The incision was transverse. I found a transverse fracture of the patella, the line of separation being nearer the lower margin. The lower fragment was chipped a little, and the upper portion broken into two longitudinal fragments of unequal size, not separated from each other, but held loosely together by their fibrous investments. The margins of the upper and lower portions were freshened and held by two wire sutures, which were both passed into the larger lateral division of the upper fragment. The joint was drained thoroughly on each side and superficial tubes were introduced beneath the skin. The capsule was sewed separately with catgut. Healing here was uneventful, and function was finally restored to a large extent; but, when the patient was last seen, flexion beyond a right angle was impossible.

CASE V.—J. W., aged thirteen years. February 4, 1888, he fell on a slippery street and broke his patella. He was seen by Dr. Cott, who sent him to the hospital the next day. February 5th, he was operated on. There was transverse fracture with considerable effusion. The lower fragment was found to consist of the lower third of the bone, from each of whose sides a small portion had been chipped off. The cavity of the joint was filled with clots and fluid blood. Each fresh surface was covered with inverted periosteum and fibrous tissue, so that contact of the bony surfaces was impossible. The surfaces were made true and freshened with a small saw, and, after drilling, were closely united by two silver sutures, their ends being twisted and turned in between the fragments. The joint was drained by a rubber tube passed through a counter-opening on each side. The final result in this case was perfect, there being no perceptible difference in utility between the limbs.

CASE VI.—C. C., aged nineteen years. April 12, 1888, the patient fell some forty feet from a building, his fall being broken by a scaffold. He sustained a number of body bruises and a fracture of the right patella. He was attended by Dr. Earle, with whom I saw him, and who attended him after the operation. April 15th, operation was done

at his house. The fracture was found to be oblique, the line of fracture running downward and inward and dividing the bone into two nearly equal segments. There were several quite minute fragments, which were removed during the operation. The surfaces were evened with the saw, and then drilled and fastened with silver wire. Rubber drainage-tubes were used, since considerable clotted blood was turned out from the joint. In this case hemorrhage was surprisingly slight, not a single vessel requiring to be tied, nor even seized with pressure-forceps. The first dressing was made April 18th. Primary union was obtained, and by June 1st the young man returned to his work, the function of the joint being perfect.

CASE VII.—J. D., aged twenty-four years. October 25, 1888, the patient fell from the top of a box-car and sustained a Colles's fracture of the left radius and a compound fracture of the left patella. He was taken directly to the hospital, where, four days later, I operated, enlarging the ragged wound, which was immediately over the patella. I found the bone obliquely split into longitudinal fragments, neither of which was torn from its tendinous attachment, but which were rudely and badly separated from each other. After counter-openings had been made and drainage-tubes inserted, I drilled through the patellar fragments nearly at right angles to the axis of the limb and put in one strong wire suture. Excision of the torn edges of the wound and complete closure of the transverse skin wound terminated the operation. Union was perfect and immediate. The first dressing was made ten days later. December 15th, the patient had been up for two weeks; the patella was quite movable, but there were adhesions between the joint surfaces. He was again anesthetized, and these were broken up. No unpleasant reaction followed, and he made a complete functional recovery.

CASE VIII.—A. M., aged fifty years. November 10, 1888, he fell on a curb-stone and broke his right patella. He was brought to the hospital with a wide separation of the fragments and extensive effusion. On the following day I opened the joint and removed much fluid and clotted blood. The patella was broken into three fragments, the lower including more than the lower half of the bone, the remaining upper portion being split longitudinally nearly at its middle. There were also several small bony chips. There was extensive laceration of the capsule, with loosening of the skin. Bone drainage-tubes were introduced on either side and two wire sutures were inserted, each fastening one of the upper fragments to the lower one. December 19th, I anesthetized the patient again, and, while endeavoring slowly and gently to flex the leg to a right angle, the skin wound tore open. This wound was at once sprayed out, and it was then seen that the bone fragments were widely separated. The patella was then surrounded with a silver wire, which was passed with a needle through the tendinous structures above and below, and then tightened by twisting so as to reduce the size of the loop. This effort was not quite successful in restoring all the fragments to their proper place. An antiseptic dressing was applied, and the limb bound again on the straight splint. The wound healed again by primary union, and the patient left the hospital subsequently with considerable motion in the joint and every prospect of further gain, but failed to reappear for subsequent examination.

CASE IX.—J. B. H., aged twenty-five years, from Corry, Pa. The

patient's left patella was broken May 31, 1882. His right patella was broken July 1, 1890. Both fractures were transverse. In the fall of 1890 he came to the General Hospital, where Dr. Phelps operated on the left patella. The fragments at that time were separated between five and six centimetres. In order to get them together, the Doctor had to cut the tendon of the quadriceps completely across as well as widely incise the lateral aponeurosis of the vasti muscles. The result was so good that the patient was thereby encouraged to return to Buffalo and have the other patella operated upon. On March 18, 1891, the second limb was operated on by myself in clinic. The separation of the fragments was not nearly so great as on the opposite side. I found it possible to saw off the margins for the purpose of apposing the fragments, and to make the drill openings with only two slight punctures into the capsule, so well was the joint cavity shut off by a rearrangement of its capsule and organization of old exudate. Two silver wires were used, and the parts came easily together. No drainage was resorted to. In this case the result bid fair to be as satisfactory as in the case of the opposite patella, but the patient has not been seen since he left the hospital.

CASE X.—F. S., aged nineteen years. On January 1, 1892, the patient sustained a transverse fracture of the left patella just below its middle. Two days later he was taken to the Fitch Hospital and thence to the General Hospital. On January 11th, operation was performed in clinic. There appeared to have been no attempt at union. The surfaces were exposed by a transverse incision, and then evenly sawed and fastened together by two silkworm-gut sutures passed through drill openings. The patient left the hospital in about six weeks with every prospect of a complete and satisfactory result, the wound having healed *per primam*.

CASE XI.—F. J. C., aged twenty-four years. On August 23, 1890, the patient broke his left patella. He had, when seen in March, 1892, a fibrous union, the fragments being separated about five centimetres. He had a fairly useful knee but was not satisfied with it. On March 12, 1892, operation was performed in clinic. The joint was opened transversely, and the intervening fibrous bands between the fragments of the patella were excised along with a redundant portion of the capsule. The bone edges were accurately sawed and the fragments drilled for two silver wires. After their insertion, it was found impossible to get the bone fragments into apposition until I had completely divided the quadriceps tendon about five centimetres above the upper fragment. After this, the fragments came easily together. The wire ends were twisted and turned in, the capsule was sewed with catgut, and the external wound closed with buried sutures without drainage. In this case some purely subcutaneous suppuration occurred from causes unknown to me, but the joint structures were not involved. The patient left the hospital in four weeks with a knee somewhat flexible, motility improving daily, while he was walking around on crutches.

The following case of fractured patella is reported in this category, as the treatment adopted is somewhat analogous to fixation by means of wires.

CASE XII.—M. K., aged forty-two years. On January 3, 1890, the patient fell and sustained a transverse fracture of the right patella.

She was short and very fleshy and there was an enormous amount of swelling. She was sent to the clinic by Dr. B. G. Long. After five days of cold applications, on January 8th she was anæsthetized, and I operated by a proceeding at that time new to me and of my own device. Without any incision, I transfixed each fragment, or rather pierced the ligamentous or tendinous attachment of each with a long drill, leaving each end of the drills protruding through the skin. For this operation the skin had been carefully disinfected and the drills sterilized with heat. The protruding ends were approximated and held firmly together by external silk threads. Iodoform collodion was dropped freely about the needle punctures and over all an antiseptic dressing was applied. The limb was immobilized in the extended position. The result, so far as the patella was concerned, was excellent, good firm union being obtained, but the function of the joint was very materially impaired. The patient left the hospital with a limb nearly but not quite stiff, declining to take an anæsthetic again in order to have the adhesions broken up.

Since this operation was performed I have seen it or one similar to it suggested by others, but I have not been sufficiently pleased with it to feel like ever trying it again.

INHALATION OF DUST AND PULMONARY DISEASE.

BY WILLIAM BUCKINGHAM CANFIELD, A.M., M.D.,

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MAN in his primitive state was without the luxuries and conveniences of more recent times, but he was also free from many of the dangers which are a part of modern civilization. The tendency of people in later ages toward collecting into communities, villages, towns, and cities, and the steady flow of population from the country to the city, has not been without effect upon the health of these people. This is noticeable in all classes, but markedly so among artisans and workers at the various trades. The dangers attached to certain occupations is a subject by no means new. Indeed, in 1703, Ramazzini pointed out the dangers of many occupations and professions; and even if he exaggerated the actual risks, still he did much good in calling attention to an etiological factor which had probably never before been considered; and his work, which had created much criticism at the time, went through many editions and was translated into several languages. Occupations may be unhealthy from the strain exercised on special organs; from the presence of dust, poisonous or excessive in amount; from noxious vapors and gases; from too much heat, cold, or wet; from sudden changes in temperature, and from positions which develop deformities. In addition to all this, each one of these dangers may be aggravated by impure air due to defective ventilation. The crowded

condition of many of the large manufactories in England and on the Continent of Europe afforded ample opportunity to the investigators who read Ramazzini's work to study this subject under the most favorable circumstances, and early in this century Thackrah gave his experience based on a study of the factories, trades, etc., of a part of England. The principal writers on this subject in more recent times are Zenker, Pearson, Peacock, Hirt, Meinel, Arnold, Greenhow, Arlidge, Mendelsohn, and numerous others. They have written more particularly on the diseases due to the inhalation of dust.

Those who believe that every available space in the atmosphere is crowded with minute particles of dust and microorganisms, pushing and elbowing each other for more room, may have a wrong impression of the microscopical appearance of the air which we breathe in cities; but, on the other hand, they are equally in the wrong who claim that an undisturbed atmosphere is free from dust and microorganisms. There may be the visible, palpable dust which is abnormal, and that which is only made apparent by the sun's rays or some strong illumination. Few are the occupations in which some dust is not thrown off, and in most instances it is very harmful. The presence of an excessive amount of dust, especially in closed rooms, is dangerous on account of its mechanical effects on the lung substance; on account of poisonous materials which may get into the system through this channel; and it is particularly dangerous because many diseases are introduced into the system through the mouth and breathing apparatus.

The various kinds of dust, like the kingdoms, may be divided into animal, vegetable, and mineral. Opinions seem to differ as to which kinds are the most dangerous when inhaled. That which is generated in brush factories is animal, and very harmful. Makers of hats, especially of felt hats, suffer much from the dust evolved in preparing the felt. It may be that the mercury used in this trade exerts an injurious effect, and the roughened hairs of the felt getting into the lungs, cause marked changes. The vegetable dust that does the greatest and most lasting injury to the lungs is, according to the best authorities, that generated in tobacco factories. This does harm not only on account of its mechanical action, but also because of its poisonous effects. It is in connection with the inhalation of mineral dust, however, that the greatest amount of scientific work has been done, and especially in those diseases called, respectively, consumption of grinders, miners, potters, etc., that are caused by mineral dust; and it is with this class of cases that my limited experience lies. As these cases have all been reported before, I shall not narrate them again, but only say that one was a stoker, one a furnace cleaner, one a miner, and one a grinder.

The diseases caused by the inhalation of these various kinds of dust have received a variety of names, according to the kind of dust inhaled.

Thus, anthracosis, silicosis, siderosis, tabacosis, and other kindred names have been suggested to describe a corresponding condition produced by the various kinds of dust, and Zenker has handed down the very clumsy word "pneumonokoniosis" to cover all these conditions. This was particularly necessary, because often a mixture of several kinds of dust may cause this condition. Thus, grinders, needlemakers, pin-pointers, cutlers, etc., inhale a mixture of metallic and mineral dust, and this is said to be the most perilous of all occupations—even more so than workers in vegetable dust. The dust from such minerals as arsenic, lead, and mercury produces a constitutional effect far in excess of any mechanical effect. The condition produced by metallic dust is particularly characterized by its slow course, and in this way differs from a typical case of pulmonary tuberculosis; it also differs from that disease in two other very important particulars: it is not hereditary, and, if the dangerous occupation be abandoned, the tendency is to recover, even when the disease is far advanced, and in old persons, too. The history of my cases is very much alike. They began with a simple bronchitis which gradually became chronic. It was in one case associated with asthmatic and emphysematous symptoms; in another it went on to emaciation, and the expectoration was muco-purulent.

These cases are usually non-tuberculous, at least at the beginning, and the tuberculous complication is only an accident. Most persons agree that the inhalation of non-tubercular dust can only produce a non-tubercular disease of the lungs. When one is exposed to an atmosphere of dust, the contact of this dust with the sensitive laryngeal and nasal mucous membrane sets up a coughing and sneezing, and much of the dust is expelled, and for a time no harm results; but a continued exposure to this dust causes a congestion of the mucous membrane of the nose and the breathing passages, and in time an inflammation of the whole tract, and as this continued irritation keeps up the ciliated epithelium loses its power and the dust-particles find their way to the ultimate ends of the lung tubules. When the individual is asleep or absent from this irritation, the ciliated epithelium may then try, and actually does, get rid of a large part of this foreign substance, and the wandering cells or phagocytes may close around this dust and try to carry it off or render it harmless by burying it in a lymph gland. Much of the dust is undoubtedly got rid of in this way, but much of it penetrates the delicate mucous membrane of the respiratory tract, finding its way either through the epithelium or between the cells into the sub-mucous layer, getting into contact with the connective tissue of the alveoli, and by irritation causing a hypertrophy of this tissue and a condition resembling chronic interstitial pneumonia or fibroid phthisis. Pathologically, the character of the lesions in the lungs is often greatly obscured by the discoloration produced by the foreign particles deposited

in the pulmonary tissue; but, as a rule, we notice that the destructive lung diseases due to dust-inhalation occur at rather a later period of adult life, and advance slowly to a fatal termination, thus resembling fibroid phthisis.

In all these conditions true phthisis is absent unless the tubercle bacillus gets into the lung; and the general opinion seems to be that the tubercle bacillus is not present in these conditions, that the fibroid condition seems to oppose a direct barrier to the growth and multiplication of the bacillus tuberculosis, and in large tracts of lung tissue which had been converted into this material often not a bacillus could be detected. This statement was especially interesting to me, because in one case, that of the miner, which I have already reported, the bacilli were found in abundance, and yet two years afterward he wrote to me that he was entirely well. One prominent sign in these troubles is the color of the expectoration. The "black spit," as the English call it in connection with their miners, is not only very characteristic, but it shows how Nature, by the aid of these carrier cells, is endeavoring to get rid of this offending substance. In the case of the stoker to which reference was made, the expectoration still continues absolutely black at times, and always tinged, although it is almost two years since he gave up his occupation. The examination of bits of this black sputum under the microscope showed it to contain in abundance these carrier cells, which in all cases contained pigment, and in some instances the black crystalline coal could be recognized within these cells.

All city dwellers have more or less pigment in their lungs, and these pigment-containing cells can almost always be found in the morning saliva of smokers. This pigment and foreign material has a tendency to collect at the apices of the lungs, and is only present at the bases when the dust inhaled is excessive in amount and the exposure prolonged. We know that phthisis generally begins at the apex. This fact of apex predilection seems to have received a variety of explanations. I have always felt inclined to accept the explanation of Hanau, who said that the local predisposition of the apices of the lungs is due not to imperfect inspiration, but to impeded expiration. This need not exclude the theory of invasion through the lymphatics and blood-vessels.

The diagnosis of these cases should not be difficult after the history has been learned. Examination by physical diagnosis does not yield as much as by the microscope. By the aid of the latter method we see the cells containing the dust; by the former method, in my cases, I have not been able to get anything but râles on auscultation, and nothing marked on percussion. Tubercle bacilli should always be looked for; they will rarely be found.

The prognosis is good if the man has not worked too long at the

occupation. Peacock's experience with the French millstone-makers was that most of them died of chest disease. The oldest at the work had only been employed thirteen years, and those who took to the trade early did not live beyond forty. Bristowe, who made the autopsies for him in these cases, reports: "The diseased portions of the lung were much indurated, having generally an opaque whitish hue, but being thickly studded with black pigment. Under the microscope little or no trace of ordinary lung structure was visible, but the diseased masses appeared to be made up of dense, closely arranged fibroid tissue, studded here and there with numerous irregular groups of black pigment, and generally with an abundance of transparent globules of various size. The bronchial glands were like the lungs. A part of the lung was heated, and the ash that remained looked like siliceous matter."

Statistics show that the workers at these dangerous occupations live a much shorter time than others in occupations not so hazardous; and that they tend to recover quickly when removed from their injurious surroundings.

The treatment, then, is to remove the cause—that is, take the case from his dangerous occupation. As soon as this is done, improvement begins at once. Still, if so many workmen are affected by this dust, and the remedy is to remove them from their work, there would soon not be enough workmen to supply the demand. Owners of large factories, who for a long time resisted all attempts at investigating the dangers of the work, have at last found it to their interest to adopt some stringent prophylactic measures in order that they may not lose so many good workmen.

The best methods are:

1. To prevent the formation or the escape of the dust by using wet grinding, or by grinding in closed vessels; but this is by no means practicable. Many articles, such as needles, can only be ground dry.

2. Prevention of the inhalation of dust by wearing respirators, masks, and similar protectors. These are so uncomfortable that the men will remove them at every opportunity.

3. The removal of dust as fast as it is produced, by using mechanical fans and air-shafts. This is by far the best plan, and, where adopted, has been the means of removing much of the danger of these occupations.

Still further, the following rules should be enforced:

1. The workmen should change their outer clothing after work.
2. They should keep their faces and hands clean—that is, as clean as their work will allow.
3. They should never be allowed to eat in the work-room. It is hardly necessary to add that women and children should never be employed in these dangerous occupations. The therapeutical treatment

is not unlike that used in the ordinary cases of bronchitis, emphysema, phthisis, etc.

In undertaking such a work as this the intention was not to cover the subject of the effect of dust-inhalation on the whole body. Dr. Wm. H. Welch has reported in the *Johns Hopkins Hospital Bulletin* a very interesting case of dust-inhalation, in which the dust was found not only in the lungs, but also in the liver and in other organs. It is very important that all such cases should be recorded, for in studying the invasion of disease through bacteria, every avenue and means of approach of these bacteria should be considered, and not the least is that by the inhalation of dust.

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CORTICAL EPILEPSY—OPERATION; RECOVERY.

BY ALEXANDER B. SHAW, M.D.,
OF ST. LOUIS, MO.

THE case herein described was presented to the St. Louis Medical Society early in January, 1892, about three weeks after being operated upon. I was first consulted regarding the patient on December 9, 1891, and then secured the following history :

Mrs. J. G. N., aged thirty-one years; multipara. No history of traumatism, rheumatism, or syphilis. Seemed perfectly healthy up to the time of the first seizure, which occurred without premonition in March, 1890, when, while washing dishes, she had a convulsion; speedily became unconscious, and remained so for some time.

During the succeeding six months she had similar attacks about every eight weeks; afterwards they became more and more frequent, notwithstanding treatment, until by March, 1891, she was having a fit every three or four days. At this time many of the seizures, probably three-fourths, were unaccompanied by loss of consciousness. The frequency of seizures accompanied by loss of consciousness was materially lessened by the use of the bromides, but mild attacks of Jacksonian epilepsy continued to recur almost as often while the bromides were being administered as they did when the treatment was suspended.

During the first few months of the trouble it was noted that both mild and severe forms were always preceded by a sensation of either prickling or numbness, or both, beginning in the right hand and gradually extending up the right arm. Frequently this paræsthesia would persist for as much as one or two minutes before the arm would be convulsed. Convulsive jerking of the arm always followed this initial symptom—paræsthesia.

Sometimes the brachial spasm—clonic—would terminate the seizure. More frequently, however, the jerking of the arm would immediately be followed by forced extension of the toes of the right foot and simul-

taneous jerking of the right leg. Occasionally seizures of the type last described—still plainly Jacksonian—would, after a short duration, terminate without loss of consciousness, but more frequently the next symptom in sequence would be general convulsion with unconsciousness and conjugate deviation of the face and eyes to the right.

During the twelve months preceding the operation she had considerable pain, almost continuous in character, in the right arm.

There is right hemiplegia involving the face—lower part—arm, and leg. The paralysis is intensified for several hours after a severe seizure.

The paralysis came on gradually and deepened continuously. It was first noticed in the arm.

While sitting or walking the patient inclines to the left. The memory has been considerably impaired for the past six months, and is gradually becoming worse.

There is some evidence of pulmonary phthisis, and the general nutrition is below the normal.

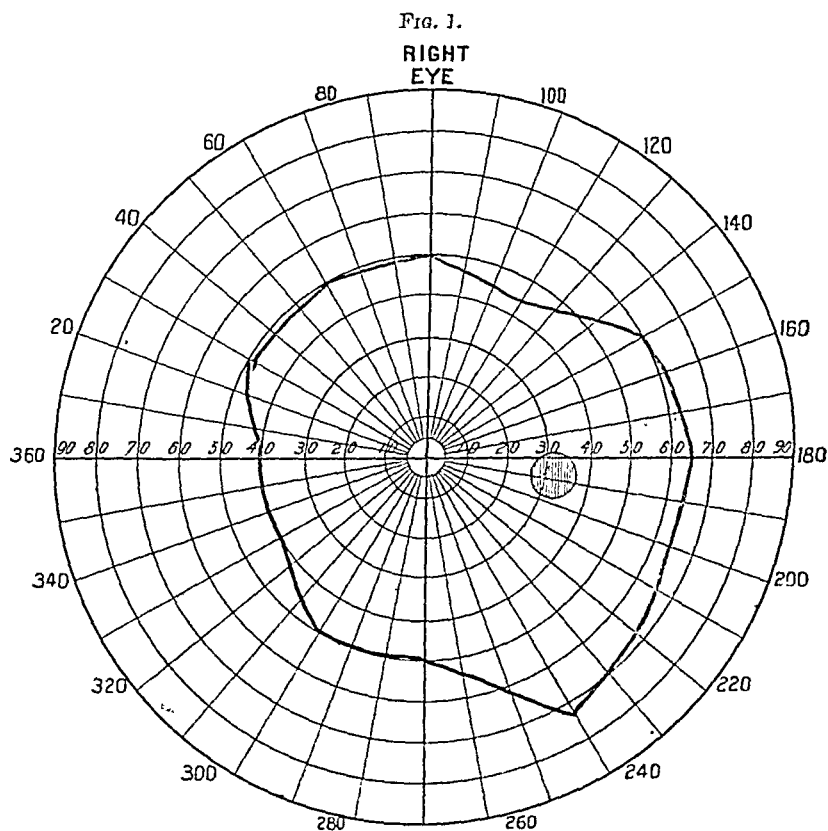


Diagram showing limitation of field. Right eye.

During the three weeks preceding the operation the patient had ten convulsions during which there was loss of consciousness—severe type—and twenty seizures of the Jacksonian type without loss of consciousness.

Since the date of the operation, December 14, 1891, there has been

absolute absence of all pain, paræsthesia, spasm, or convulsion of any sort. Mentality has improved; the facial deformity is less apparent, and locomotion is decidedly easier; but there is absolute loss of voluntary motion in the right arm, the motor centre of which was the objective point sought in opening the skull. That it was reached is abundantly attested by the resulting condition.

The only diagnosis thus far possible was *irritating and probably destroying lesion of the arm-centre in the left hemisphere*, and hoping to obtain further data upon which to base an opinion as to the character of the lesion from a careful ophthalmoscopic examination, I referred her to Dr. A. Alt, whose findings were as follows: "Very marked anæmia of the left disc and one strangely dilated vein in right retina. Field in both eyes concentrically limited."

FIG. 2.

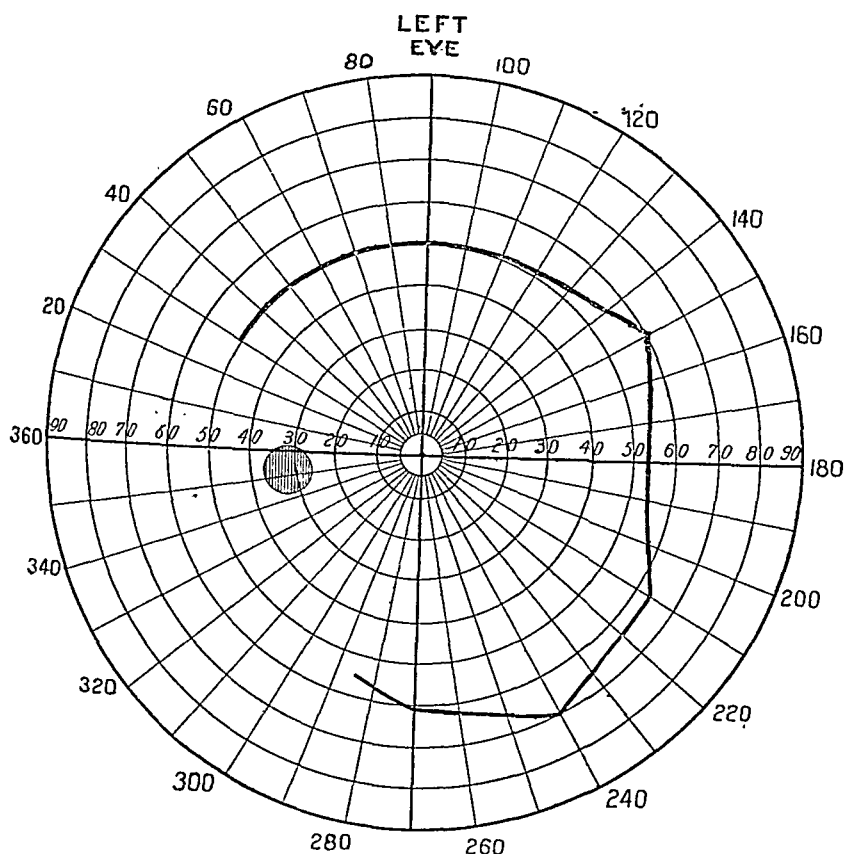
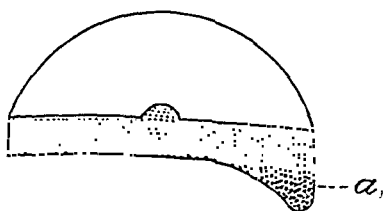


Diagram showing limitation of field. Left eye. The examination of this eye could not be completed because of faintness of the patient.

Notwithstanding the fact that the trephine was made to penetrate equally at every point until the dura was reached, great difficulty was experienced in removing the button of bone, because of a considerable thickening of the skull throughout two-thirds of the circumference of the trephine opening. (See Fig. 3.) This increased thickness was

greatest at a point exactly opposite that at which the inner table had been cut through, and exactly over the arm-centre in the ascending frontal convolution.

FIG. 3.



Cross-section of button, showing thickening at *a*, at which point an osteophite of the inner table was cut into.

After the elevation of the button the thickened portion of the skull over the arm-centre was removed with the rongeur forceps, leaving an opening which measured one and one-half by two and one-fourth inches.

The veins over the fissure of Rolando were very large and full, showing plainly through the dura. Cerebral pulsation was quite perceptible. On opening the dura the exposed surface was observed to be much darker than normal, the cortex being pigmented, and the brain bulged into and in a peculiar manner completely filled the opening in the skull. By the term peculiar manner, I refer to the fact that instead of the protruding mass gradually rounding out from its point of contact with the opening in the skull (see Fig. 4), as healthy brain should do, it adapted

FIG. 4.



itself, because of its softened condition, more exactly to the perpendicular walls of the opening in the bone, and in addition presented a flattened surface at its summit. (See Fig. 5.) At a point corresponding with

FIG. 5.



that at which the osteophite had attained its greatest thickness the brain seemed to fluctuate to touch, and so certain were we (Drs. McCandless, Dalton, and myself) that puncture would reveal the presence of fluid, that twice I buried a trocar obliquely inward and forward, and downward and backward, in the brain, penetrating it each time to a depth of one and one-half inches, but without discovering either a cyst or abscess.

The softened area shaded off so gradually into tissue of normal appearance and resistance that further instrumental interference was deemed inadvisable.

However, while cleansing the wound and exposed brain surface a considerable quantity of sterilized water was made to flow directly on the softened part, and it was observed that it soon became lighter in color and more homogeneous in appearance. Possibly some of the cortical substance was thus removed or broken down.

The operation was completed in less than half an hour. The temperature remained below 100° F. The wound healed by first intention. The patient left for her home the twelfth day after the operation.

According to the generally accepted teachings as to the location of the cortical area in which are perceived sensations and pain, the pain and paræsthesia experienced in the paralyzed arm in this case should have been taken as an indication of involvement of the cortex between the ascending parietal convolution and angular gyrus; but the fact that the operation on the brain, which as demonstrated by the resulting total paralysis of the arm, was made on the arm-centre, relieving at once and permanently the pain and paræsthesia without in the least impairing sensation, would tend to show that sensory centres exist in the recognized motor area as well as in the generally-conceded sensory region of the brain.

The conjugate deviation of the head and eyes in this case toward the paralyzed side is in keeping with the fact that, in cerebral lesions high up, with paralysis on the opposite side from the lesion, if associated with convulsions, deviation will be toward the convulsed members.

NOTE.—Although nearly seven months have elapsed since the operation, it is still too early to predicate permanently favorable results, but so far there has been no return of pain, paræsthesia; or convulsive movements. As the case was clearly one of cortical epilepsy, growing out of irritation of the arm-centre, and as the arm-centre has not manifested any tendency to resume its motor function since the operation, I believe there is reasonable ground for expecting a permanent arrest of the epilepsy.

The profession will be apprised of the further progress of this case.

RETRO-PERITONEAL TUBERCULOSIS; SIMULATING HERNIA.

By EDWARD P. DAVIS, A.M., M.D.,

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THE atypical character of the lesions found in the following case, and the difficulty in diagnosis which existed in the minds of those who saw it, lead me to report it, hoping that it may be of service in the study of the less common forms of disease found among women.

M. S., colored, aged thirty-nine, consulted one of my clinical assistants in February, 1892, complaining of pain in the right inguinal region which she thought had followed lifting a heavy weight. Fever (103° F.), rapid pulse, tenderness, and swelling soon developed, and pelvic peritonitis was evidently present. After forty-eight hours of unavailing treatment the patient was sent to me at the Philadelphia Hospital, March 3d.

On admission, the patient gave a history that while washing, a year previous, she felt a sensation of something giving way, followed by bearing-down pains; subsequently pain developed in the right ovarian region which kept her in bed eleven weeks, during four of which she had metrorrhagia. She recovered, and resumed her work as a domestic until February 29, 1892, when, after a morning's hard work, she was again seized with severe pain in the right ovarian region.

The patient's general history was afterward found to be as follows: Father died of pulmonary tuberculosis; five brothers and two sisters died from unknown causes. Patient had usual diseases of childhood. Married at eighteen, had borne thirteen children, labors uneventful, convalescence speedy. No history of alcoholism or specific infection.

On examination, the patient was well nourished. Thoracic viscera normal. Urine rich in urates, highly colored, small amount of albumin. Abdomen moderately distended, not tympanitic; in right inguinal region a tense swelling which was but little affected by coughing or straining. Hypogastrium swollen and tender on pressure. Vaginal examination negative. Temperature, evening, 102.5° F.; morning of day of operation, 100° F. Pulse ranged from 140 to 104. The patient was examined by several of the medical visiting staff, who thought the condition strangulated hernia or pelvic peritonitis from tubal disease. It seemed my duty to examine the patient thoroughly by exploratory incision to ascertain the cause of disease, and remove it if possible.

After suitable preparation the patient was anesthetized, placed in Trendelenburg's posture, and with the assistance of Dr. George E. Shoemaker I incised the tumor in the right inguinal region. A firm mass occupied the right inguinal canal and protruded from the external ring. This pyriform swelling was about three inches in length, completely irreducible, quite hard, and did not appear to contain fluid. In fact, it strongly resembled in external appearance an inflamed and strangulated omental hernia.

Incision, however, showed nothing which had the ordinary appearance of hernial sac and contents, though the dissection was continued, under the impression that the mass found must be thickened sac and contained bowel or omentum. After much difficulty a rounded mass was dissected loose from the canal and traced to the internal ring, which was nicked; but so far from being an ordinary hernia, the mass proved to be only a stem-like, firm process from a resisting body just within the internal ring, and into which body the stem passed smoothly on all sides. An incision was now rapidly made in the median line of the abdomen, when a broad, flattened tumor was found to have raised up the peritoneum of the front of the pelvis to immediately overlie the internal ring on the right side. This swelling was perfectly smooth, and resembled in shape an inverted saucer. The appendix, broad ligament, tube, and ovary occupied their normal relations, and had no connection with the mass, nor were any

bowel adhesions present. It appeared like a fluid-containing cavity with a thick wall.

A finger in the inguinal canal was now thrust into the abdominal enlargement to the inner side of the stem, when a gush of yellowish-white, thin fluid containing many shreds and flakes showed that a probable tubercular abscess had been opened. The intra-abdominal mass at once collapsed. The peritoneum not having been disturbed over the tumor, the abdomen was closed, with a drainage-tube. The stem-like mass in the inguinal canal was tied off and a drainage-tube passed beside the stump into the abscess cavity. The inguinal process from the abscess proved to be hollow, the thick and firm wall being made up of new tissue entirely, being nothing more nor less than a prolongation of the abscess wall. The peritoneal cavity was fairly flushed with saline solution and drained. The patient's condition of collapse was successfully treated by subcutaneous injections of saline fluid and stimulant.

The patient's recovery occupied a period of three weeks. The abdominal incision healed promptly. The inguinal incision healed where it had been sutured, and was allowed to granulate at its lower portion, from which a thin, purulent discharge persisted. Microscopical examination of the mass removed from the inguinal region showed it to be lymphoid tissue, with a capsule of thickened serous membrane and connective tissue. Bacteriological examination of the pus from the inguinal region discovered the cocci of suppuration; no tubercle bacilli were found. During the patient's residence in the hospital the spinal column was examined as thoroughly as possible, but no indications of spinal caries or psoas abscess were present.

On July 3, 1892, this patient was examined for me by Dr. A. A. Eshner, who reports as follows: Persistent cough without expectoration. She weighed less than she did a year ago. There have been no chills, fever, or sweats.

July 25th. The central incision had healed late in May. The opening left at the site of the inguinal incision has grown gradually smaller, until now there is but a small sinus. But for the annoyance that this occasions, the patient would feel entirely well. She has resumed her occupation as a laundress, and when she engages in work unusually laborious finds that her wound bleeds slightly. Ordinarily there is a daily discharge of from a drachm to four drachms of thin sero-purulent fluid.

31st. The patient is well nourished and performs arduous labor as a laundress. She suffers from pains in various parts of the body, and has tender spots at one or two points of the dorsal spine. An exceedingly small sinus exists in the inguinal region from which a drop can be expressed. The median incision has united firmly. The pulmonary percussion resonance is unimpaired, and the respiratory murmur is vesicular. The action of the heart is regular; the sounds are clear.

The literature of retro-peritoneal tuberculosis is not extensive. The lesions present at operation, the patient's history and her recovery incline me to think that she suffers from tubercular infection of the retro-peritoneal glands, and that one of these glands prolapsed into the inguinal canal and suppurated, thus inducing peritonitis. The following cases

of lesions somewhat analogous are all which search through the literature of the subject has revealed :

CASE I. (August Bier, *Deutsche medicin. Wochenschr.*, June 8, 1892, No. 23, p. 538.) *Tuberculous mesenteric and retro-peritoneal glands; extirpation; recovery.*—A boy, sixteen years old, without hereditary predisposition, a year before coming under observation suffered with attacks of severe pain in the umbilical region. This disappeared after a few months to return several months later in intensified degree. There were also frequent nausea, vomiting, and vertigo, particularly during the attacks of pain. The patient was somewhat emaciated, extremely anæmic, and complained of constant pain in the abdomen with paroxysmal exacerbations. Two tumors, as large as walnuts, were indistinctly palpable, deep in the left mesogastrium. These were sensitive to pressure and but slightly movable, and unaffected by changes in posture. No connection with the stomach could be made out. The pain during the paroxysms was referred to the situation of the tumor. The bowels were regular, the stools normal in color, quantity, and consistence. The urine was normal in amount, and without pathological constituents. A diagnosis of retro-peritoneal tumors was made, and purgatives with abdominal massage employed for a week without much change. When the patient was anesthetized it was found that the tumors were larger than they had previously appeared and that one of them was quite movable. Cœliotomy was performed, an incision being made in the linea alba. Two masses of enlarged lymph-glands, each as large as half a fist, were found; the one retro-peritoneal, to the left of the root of the mesentery, and the other within the mesentery of the small intestine. In the course of the operation some of the glands ruptured and gave exit to the discharge of pus and cheesy matter. Some of the glands were closely related to the mesenteric vessels. One gland, almost as large as a walnut, was inseparably united with the mesenteric vein.

The various abscess cavities were treated with iodoform, and the peritoneal cavity was carefully irrigated. The wound was closed, and in the course of five weeks and a half the patient was dismissed.

During a year and a half afterward there had been no return of the symptoms, the patient remaining in good health.

The tumors varied in size from a hazelnut to a walnut; they had largely coalesced into one mass. Altogether, they were as large as a man's fist. On section, all presented central caseation; in some with partial calcification. Microscopically, the glands presented characteristic tubercles.

In a survey of the literature only three analogous cases could be found.

CASE II. (Reported by Tillaux, referred to by Senn, *The Present Status of Abdominal Surgery*, Chicago, 1886, p. 59.)—A man, thirty-one years old, was attacked with severe abdominal pain. For twenty-five days he suffered with paroxysmal pain and obstinate constipation. Diagnoses of chronic intestinal invagination and floating kidney, respectively, were made. Thirty-eight days after the onset of the illness cœliotomy was performed, and a cystic tumor, as large as the head of a child, was found in the right side of the mesentery, uniting the intestine to the vertebral column. Puncture permitted the escape of cheesy pus. The base of the tumor was ligated with catgut, and the tumor was removed. The pain ceased and complete recovery ensued. Histologically, the growth was found to be constituted of glandular tissue containing the products of cheesy degeneration.

CASE III. (Czerny: "Ueber die chirurgische Behandlung d. Intra-peritonealer Tuberculose." *Beiträge zur klinischen Chirurgie, Mittheilungen aus den Kliniken zu Tübingen, Heidelberg, Zurich, u. Basel*, Bd. vi., Heft 1.)—(1) A woman, fifty-six years old, was, after a meal, seized with vomiting, pain in the epigastrium, and increased frequency of bowel-movement and micturi-

tion. Below the left costal arch a firm, readily movable tumor, as large as an apple, and painful upon pressure, was detected. Gastric splashing could be elicited. When the stomach was filled the tumor was displaced to the left. By artificial distention of the stomach the tumor became more distinct. The pulsation of the aorta was transmitted to the mass. A provisional diagnosis of tumor of the stomach, not pyloric, was made. Seven months later celiotomy was performed. A cystic tumor, as large as an apple, was found in the duodeno-jejunal ligament, lying partly behind and compressing the duodenum. The cyst was punctured, grasped with cyst-forceps and enucleated. It was surrounded by fatty tissue. The superior mesenteric artery and vein surrounded the tumor at its base. The patient recovered. The tumor was considered a lymph-cyst developed by fatty degeneration of a tuberculous lymph-gland.

CASE IV.—(2) A woman, thirty-six years old, suffered with abdominal pain, but soon noticed a movable tumor in the abdomen. She was emaciated, and presented cicatrices on the neck. Below the umbilicus was a tumor made up of three nodules. Its diameter was 11 by 6 c.cms. Below this tumor was a larger, less movable swelling. A diagnosis of tumor of the retro-peritoneal glands, possibly tuberculous, was made. Some five months later celiotomy was performed. A fluctuating tumor was found in the mesentery of the uppermost loop of the ilium. With the usual precautions the growth was split and enucleated. Below the loop was a second suppurating enlarged gland, and here two caseous glands were enucleated. Both cavities were packed with iodoform-gauze. Some time later, death took place from peritonitis, despite operation. At the autopsy peritonitis and intestinal diphtheria were found. The defects resulting from the removal of the enlarged glands were evident. The lower one was subdivided into two, the walls of which consisted of coalesced tuberculous glands. The upper lobe of the right lung presented broncho-pneumonia and bronchiectasis. There were several cheesy lymphatic glands in the left supra-clavicular region.

In the first case, it is contended that the condition was one of primary local tuberculosis of the mesenteric and retro-peritoneal glands. The absence of intestinal symptoms is against the existence of primary intestinal tuberculosis. The fact of recovery after operation is in favor of the local character of the affection. Nor after the operation could other tuberculous involvement be found.

That primary tuberculosis of the abdominal glands may occur is demonstrated by a case reported by Demme (*24. med. Bericht über die Thätigkeit des Jenner'schen Kinderspitals in Bern im Laufe des Jahres 1886*; Bern, 1887); a male child, four months old, presented local tuberculosis of the mesenteric glands, although most careful investigation failed to disclose the existence of any other focus of tuberculous disease. The source of infection was traced to a tuberculous cow, the milk of which was given to the child.

In the diagnosis of primary tuberculosis of the lymphatic glands of the abdomen the extreme sensitiveness of the tumor may be of importance.

The question as to the manner in which tubercular infection of the pelvic and abdominal tissues occurs is not always evident. Tuberculous food may infect the intestines, but such infection is often fatal. It has been thought that tubercular infection of the genitalia can be conveyed by sexual intercourse, but this is not proven. The inspiration of tuber-

culous dust may infect the retro-bronchial glands and posterior mediastinum, and general infection of the tissues in front of the spinal column result. Tubercle bacilli are often absent from the pus of tuberculous abscesses when suppuration has been in progress a considerable time. The recovery of the patient is a frequent result in operation upon tuberculous individuals, although in the present instance it has deprived us of that most certain method of diagnosis in abdominal surgery—a post-mortem examination.

A CASE OF PLICA.¹

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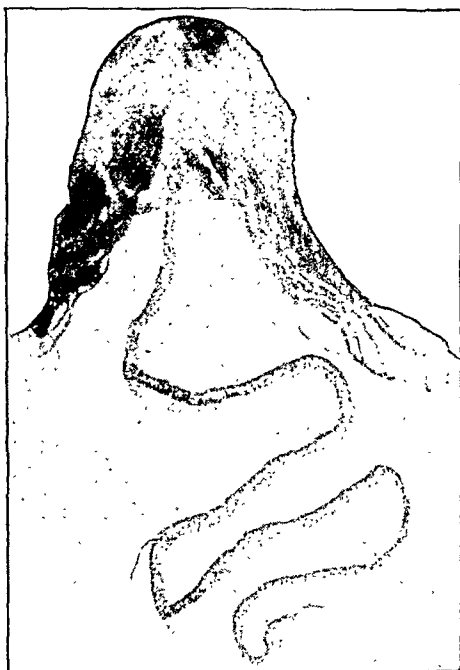
THE somewhat unique case shown in the accompanying photograph and the notes of which I herewith briefly present, came under my notice some months ago.

The patient, an extremely ignorant Irishwoman, aged forty, had been in this country but some weeks when she applied at the dispensary for treatment for an ordinary acne eruption. At her second visit she was accompanied by her sister and brother-in-law, who desired to call my attention to a peculiar hair growth upon the patient's scalp. The hair, upon disarranging for examination, was found, with the exception of the part referred to, to be normal and reached to the shoulders. From a dollar-sized area in the middle of the occipital region, however, well down toward the neck, the hair had grown into a felted lock, about the thickness of a thumb, and four feet one inch in length—extending, in fact, to the patient's ankles. The skin from which it sprang was normal, and the hair arising therefrom for about three-fourths of an inch from the scalp exhibited no tendency to felting or irregularity; beginning here it rapidly passed into a soft, closely-felted mass with an irregularly smooth surface, with here and there hair ends projecting. Toward the extremity the lock for several inches began to taper, and terminated in a brush-like end of about the thickness of a small finger. The mass was dry, without stickiness or offensive character, and free from vermin. The growth had begun twelve years back, and it had been gradual. When the sister who had accompanied the patient to the dispensary left Ireland ten years ago, the lock, as she remembered it, was then six or seven inches longer than the other hair and presented the same felted condition.

The growth in all its aspects was carefully examined and gave no evidence of being in any way due to lack of care or want of cleanliness; moreover, there was no sign or indication that the patient herself

¹ Read at the Fourteenth Annual Meeting of the American Dermatological Association.

was at all responsible for its existence. So far as could be determined by careful investigation this curious formation had been of spontaneous origin, slowly becoming longer and longer, and that, too, without any corresponding growth or tendency to felting of the hair of the rest of the scalp. In this instance, as indeed in all cases of plica, the patient



and her relatives and friends looked upon it with more or less awe and superstition. I regret to say that my failure to recognize the full depth and import of this reverential feeling lost me an opportunity for the further study, macroscopical and microscopical, of this unusual formation, inasmuch as an unfortunate suggestion made as to the advisability of cutting the lock off close to the scalp (with the idea in view of ascertaining whether the new-growing hair would exhibit the same tendency) was met on all sides with fear and doubt, and led, I believe, to the patient withdrawing herself from observation.¹

¹ It is possible, as Dr. James C. White suggested in discussing this case, that the condition may be caused by some different arrangement of the cells of the cuticle of the hair, corresponding to that of the hairs of those animals in which natural felting or matting takes place.

REVIEWS.

THE DISEASES OF THE STOMACH. By C. A. EWALD, M.D. Translated by MORRIS MANGES, A.M., M.D. New York: D. Appleton & Co., 1892.

THE appearance of Ewald's book in English has been looked forward to with lively expectancy by those who possessed some knowledge of his accomplishments, and the protracted delay in its publication rather added to than diminished this interest.

Now that it has received critical examination, there is revealed unusual care, both in its translation and editing, and Dr. Manges is entitled to the thanks of the profession for the manner in which he has performed his task.

This work represents the second volume only of Ewald's *Klinik der Verdauungskrankheiten*—the first volume having made its appearance in English through the channel of the New Sydenham Society—and consists of the revised stenographic reports of twelve lectures delivered before the *Ferienurse für praktische Aerzte*.

Naturally the style is easy and colloquial, but it is nevertheless clear, precise, and sufficiently exhaustive, and everywhere are evidences of the care of the laboratorian as well as the calmness and judiciousness of the cultured clinician.

The first two chapters comprise a description of the methods of examination and the technique of examination and treatment, including the use of electricity.

The wide experience of the man is here exhibited, and his statements are in marked contrast to those of some who are too ready in applauding or denouncing procedures that have had trial for the most part in their own imaginings.

Thirty pages are devoted to the consideration of gastric chemistry. As to the state of the stomach contents during digestion, it is declared necessary to determine, first, whether or not there is acid reaction, then the degree and nature of such acidity; and it would appear that the reader must appreciate the necessity of definite knowledge as to the place and purpose of lactic and hydrochloric acids respectively, if he is ever to succeed in managing gastric derangements.

Günzberg's reagent is justly pronounced far superior to other tests for free HCl, and the real position of Congo red—that of a delicate test for acids and not for hydrochloric acid alone—is so defined that one hopes for the obliteration of many loose statements of the past.

The author's experience with tropæolin 00 has evidently been more satisfactory than that of some of our observers, who have found it eminently unstable in solution and have failed to obtain its reaction with HCl or organic acids after its solution had stood for a few days.

A slight error occurs on page 23 in the omission of one of the ciphers in the figures representing the amount of HCl neutralized by 1 c.c. deci-normal soda solution. Instead of 0.03646 it should read 0.003646.

It is evident from his guarded statements that the author's experience with electricity is limited. While urging its use, it is apparently more from analogy than from actual demonstration that he reaches his conclusion.

Nothing is said about the use of electrolysis in treatment of stenosis of the cardia or of the œsophagus. His experiments in exciting gastric movement by internal faradization in animals are opposed by the experience of some observers. The utility of the method is not questioned, but is Professor Ewald quite sure that gastric motility is so readily provoked by the electrical current?

The question of gastro-ectasis has never before received such masterly treatment as in Chapters III. and IV. of this work. These pages alone should stamp the book as a necessity. The author does not accept with Bouchard the theory that the great majority of all chronic dyspeptics suffer from dilatation, although its frequency is acknowledged.

It is possible that Bouchard's position is somewhat misapprehended by Ewald, who speaks so earnestly of the importance of "gastric insufficiency."

Certainly in France the followers of Bouchard, while insisting upon the correctness of his conclusions, on the other hand, clearly differentiate between gastro-ectasis, insufficiency, and megagastria, and it is made to appear that Bouchard spoke of these three conditions collectively. (Le Gendre, *Société Médicale des Hôpitaux*, February 26, 1892.)

Lecture V., dealing with cancer of the stomach, brings the subject up to date, and yet clearly avoids lugging in old literature and the fatigue which that engenders.

Lecture VI., devoted to gastric ulcer, while in every way excellent, is particularly strong in the presentation of the etiology of this remarkable disease, and yet one cannot leave even this conception of the subject without feeling that there is still something wanting. In this view doubtless Professor Ewald will coincide. We have to thank him for a remarkably lucid and comprehensive review of the subject, in which nothing of importance has escaped him; and in divesting the therapy of all useless and harmful measures, restricting it to rest, anodynes, ergot, and ice, with rectal alimentation during hemorrhage, he stands forth the good doctor.

The author differs from most observers in finding the seat of the ulcer most frequently in the greater curvature near the pylorus. This is so contrary to what we are in the habit of noting in this country as to make it worthy of mention.

The section on hæmatemesis is headed by the word "hæmoptysis" (page 245), evidently an accident in translation.

On page 207 he says: "If you are called to a patient with severe hemorrhage from the mouth and anus, which has occurred suddenly and has been so severe that there is danger of collapse from the profound anæmia, from these points alone you may make a diagnosis of ulcer with reasonable certainty."

A mild protest is entered here, for in hepatic cirrhosis these very events may occur and sometimes in cases presenting few other symptoms of definite character.

In Lectures VII. and VIII. are studied the inflammations and degenerations of the stomach, and are likely to prove a revelation even to those who profess a wide knowledge on the subject. It is admirable.

The gastric neuroses to which the three following lectures are devoted are introduced by a suggestive and brilliant review of the innervation of the stomach from the pen of the author's brother, Professor R. Ewald, of Strassburg. These pages are priceless; and when one has read the last of the twelve lectures, that on "The Correlation of the Diseases of the Stomach to those of Other Organs," and "The Practical Value of the Modern Chemical Tests," he lays aside the volume with the feeling that the book is indispensable and that its author is modest, honest, and great.

It is hoped that American practitioners will observe that this is a work on stomach diseases which declares that there is no such disease as dyspepsia; and in comprehending that "indigestion is the remorse of a guilty stomach," perhaps some will be incited to study anew the gastric affections along the lines laid down by this cultivated German.

To speak of it may seem trivial, and yet it seems questionable taste to recommend special manufactures of drugs and special brands of food products that appear on pages 76, 152, 212, and several others, and we regret to say that in this respect it is the American edition that is the offender.

C. G. S.

THE READY-REFERENCE HANDBOOK OF DISEASES OF THE SKIN. By GEORGE THOMAS JACKSON, M.D., Chief of Clinic and Instructor in Dermatology, College of Physicians and Surgeons, New York, etc. Small 8vo., pp. 553. With fifty illustrations. Philadelphia: Lea Brothers & Co., 1892.

IN this era of publication of dermatological "essentials," handbooks, treatises, and atlases, the student will experience no difficulty in finding any number of safe guides to the study of this branch of medicine. The book before us is a satisfactory increase to this number, and its advent shows to the medical public what was already known to his confrères, that there is in the dermatological ranks another active, conscientious teacher and writer. The subject-matter of the book is divided into two parts. The first part, of twenty-eight pages, is devoted to general considerations, touching briefly, but understandingly, upon the anatomy and physiology of the skin, diagnosis, therapeutic notes, etc. Classification is referred to, but, as the author well remarks, "in the present state of our knowledge it is impossible to make a satisfactory classification of skin diseases;" he therefore, very properly we think, avoids the attempt, and presents, in the second part of the book, a consideration of the individual diseases arranged in alphabetical order. This arrangement has many evident advantages, and is the same as that adopted by Van Harlingen and later by Hardaway. The plan of giving the pronunciation of the various names is likewise to be commended. In reading over the separate articles it is readily recognized that the author's opportunities and experience as a teacher have pointed

out the way to a clear, yet concise, exposition of the subject. The practical parts, such as diagnosis and treatment, receive, as they should in handbooks of this size, much greater space relatively than do the subjects of etiology and pathology; yet these latter are not neglected. Scattered throughout the volume are fifty illustrations, one of which is a full-paged colored plate. The black-and-white illustrations are all, with one or two exceptions, good and appropriate. The colored plate, however, depicts an extremely rare example of an uncommon disease, and, while of course interesting, many dermatologists even will pass their lives without seeing a case of this kind. It is questionable how far a handbook or treatise is improved by the insertion of colored illustrations of dermatological curiosities. This is not said in criticism of the colored illustration of this book particularly, for it holds true of several other current works on cutaneous diseases. The same amount of expenditure put on a colored plate of an every-day disease, such as psoriasis, eczema, or other common affection, would be much more valuable and more in consonance with the teaching purposes of such publications.

An appendix is added, in which are given various well-tried formulæ for baths, lotions, ointments, etc. The book, as a whole, shows painstaking care upon the part of the author, and for the student, or for the general practitioner who is too busy to give time to careful reading of the larger treatises, it will be found a safe and valuable guide for the management of this troublesome class of diseases.

The publishers' part of the work is in every way satisfactory.

H. W. S.

RECENT OBSTETRIC LITERATURE.

HUMAN MONSTROSITIES. By BARTON COOKE HIRST, M.D., Professor of Obstetrics in the University of Pennsylvania, and GEORGE A. PIER-SOL, M.D., Professor of Histology and Embryology in the University of Pennsylvania. Parts II. and III. Philadelphia: Lea Brothers & Co., 1892.

PRACTICAL MIDWIFERY: A HANDBOOK OF TREATMENT. By EDWARD REYNOLDS, M.D., Assistant in Obstetrics in Harvard University, etc. New York: Wm. Wood & Co., 1892.

FIRST LINES IN MIDWIFERY. By G. ERNEST HERMAN, Obstetric Physician to the London Hospital. Philadelphia: Lea Brothers & Co., 1892.

THE STUDENTS' QUIZ SERIES. OBSTETRICS. By CHARLES W. HAYT, M.D., House Physician, Nursery and Child's Hospital, New York. Philadelphia: Lea Brothers & Co., 1892.

A MANUAL OF OBSTETRICS. By A. F. A. KING, A.M., M.D., Professor of Obstetrics in the Medical Department of the Columbian University, Washington, D. C. Fifth edition. Philadelphia: Lea Brothers & Co., 1892.

In the **AMERICAN JOURNAL OF THE MEDICAL SCIENCES**, April, 1892, will be found an extended review of Part I. of this work. Parts II. and III. fully carry out the favorable comment to which the review

of the first gave expression. The larger portion and much of the value of these books lie in the illustrations, which are good examples of the best photographic art of the day. The series will be a welcome addition to the libraries of Obstetrical Societies and of those physicians who are able to indulge a taste for fine editions of medical books in not common use and bearing upon topics of technical interest.

Recognizing the need for a concise expression of applied obstetric science, Dr. Reynolds has given us a book of four hundred pages. He has omitted a consideration of the anatomy and physiology of the pregnant woman and her child, and begins at once with the diagnosis of the pregnant condition. Dr. Reynolds places before the reader an interesting account of many observations and experiences in obstetric practice. He describes minutely methods of treatment which in his hands have proven successful. He is fully in accord with the modern spirit which applies to this branch the knowledge of infection which we gain from modern pathology. The reader may naturally differ from Dr. Reynolds in various points; this, however, will not in the least imply that the author has not written wisely and well, and has not been equally successful in the practical application of his knowledge.

Our study and experience have led us to different conclusions regarding several points of practical interest. We prefer chloroform as an anæsthetic in normal labor, given to a degree of obstetric anæsthesia only, in the performance of version, and in those cases where a prominent contraction ring and spastic condition of the uterine muscle threaten rupture. In prolonged deliveries with the forceps, in prolonged craniotomies or embryotomies, and in abdominal sections for obstetric complications, we should choose ether. Dr. Reynolds, however, labors under the disadvantage of living in a part of the country where local usage and opinion are virtually imperative upon this point.

We are not as confident of the value of some manipulations with the forceps as is Dr. Reynolds, possibly because we have not approached the cases described by him with a predilection in favor of the forceps. In our experience and observation, anæsthesia by chloroform, and version, seem better than some uses of the forceps which he describes; for example, the reverse application of the forceps and the forceps applied high up to the breech. Dr. Reynolds' traction rods have been found efficient and convenient by those who have employed them. Personal usage has led us to prefer the Poulet tape attachment.

In the treatment of post-partum hemorrhage the intra-uterine tampon of iodoform gauze has proven in our hands most efficient. We do not find that the author has made use of this method. Massage of the breasts is a procedure which we have seldom had occasion to employ. The careful use of the bandage, of hot and cold applications as indicated by the patient's sensations, of gentle exhaustion of the breast by the child, or by a pump, have seemed to us better methods than the employment of massage.

We miss in Dr. Reynolds's book a clear statement of the reasons for which various procedures are instituted. Certainly, a reference to the pathology of labor is indicated as a rational basis for treatment, and while this has not been entirely omitted from the book, yet we should have been pleased to have learned more regarding it from the author. In the variety of the author's experience he does not always tell us

which he considers the best procedure in a given case, and we are left desiring a more concise and clear statement regarding a given condition. The author has given us, however, an interesting summary of obstetric practice as it prevails in one portion of the country. We have been interested in the book, and commend it to those engaged in the practice of obstetrics.

The publishers have not done Dr. Reynolds the justice which his book demanded. The illustrations are of an inferior order, and although a considerable number have been supplied, yet they do not enhance the work of the author. The book is not carefully printed, and suggests a compromise between the size of the author's MS. and the price at which the publisher wished to sell the book.

Dr. Herman's little book is styled *A Guide to Attendance on Natural Labor for Medical Students and Midwives*. As such, it is one of the best books on obstetrics which we have seen. We find that Dr. Herman differs materially from other writers in several points. The diameters of the fetal skull given in this book are measured from other points than those taken in many other works. A smaller number of diameters are measured, and those which are given are shown to be important in understanding the mechanism of labor. The splendid French treatise of Farabeuf and Varnier has contributed a number of its excellent illustrations to this work. Abdominal palpation is clearly described, and its practice urged in diagnosis. Obstetric operations in the usual complications of labor are concisely and intelligently given. The author describes an ingenious method of measuring the true conjugate by the use of the hand. The book urges the faithful practice of antisepsis, and contains within its pages more practical information of value on obstetrics than any book of its size that we have seen.

In many medical schools recitations are coming in vogue to supplement didactic lectures. As books to aid in preparation for these recitations, quiz compends abound. Dr. Hayt's is one of a series now appearing, in which, by questions and answers, the student is supposed to be prepared for quizzes and recitations. The value of such books is very limited. The present book is the best of its kind which has yet appeared. We much prefer, however, a concise statement of the fundamental facts of obstetric science, in which the student is taught to reason as much as possible from cause to effect.

Dr. King's *Manual* continues to be of service through successive editions to successive classes of medical students and practitioners. The present edition contains an additional number of illustrations, and represents very fairly a concise statement of the practice of obstetrics as carried out by the average American physician.

"CHARACTERISTICS." By S. WEIR MITCHELL, M.D., LL.D. (Harvard).
New York: The Century Co., 1892.

A VOLUME on any subject from so eminent and remarkable a physician as Dr. Weir Mitchell would be sure to attract the attention and interest of the reading world. Had Shakespeare lived in our age, he

would have been obliged to acknowledge that there is something in a name: in this instance there is much besides.

The work, as its title shows, consists of a series of character sketches; until toward the end there is scarcely a hint of a plot. The personages are grouped in an informal manner, giving rise to the belief that there is no story at all, merely fragmentary descriptions; but near the close we are surprised to find more of the story-maker's methods. We are suddenly brought face to face with the problem of whether a lovely, spirited, unsatisfied woman of twenty-four shall study medicine or not. This is a question which, had the author chosen, he need not have restricted specially to the field of medicine, for Alice Leigh's craving was not so much for the vocation of a doctor as it was for something to fill her life with a deep, enduring content. Any work for which she was fitted would have appealed to her with the same compelling power, and would have yielded the coveted happiness, provided only that it was serious enough to fully develop her fine capacity. The author makes her intimate the failure of music to respond to her needs, and remembering the way in which she approached music, it is easy to see that her quest would fail. Dr. Mitchell decides this problem in the conventional and yet often natural manner by marrying the proposed candidate for medicine to the doctor who is the hero, if hero there be, of the book. This is a pleasant way of solving an enigma when the solvent is conveniently at hand; but able, intelligent, and admiring young professional men are not always sure to come to the front when most needed, and although the author states his objections to women in medicine with force and logic, it is not impossible that there remain arguments on the other side still unmet. Be this as it may, the volume shows a wide knowledge of poets and thinkers, of men and things. The dialogue is graceful, sparkling, and often dramatic, especially in the ghost-story which has for its subject Alexander Gavin MacAllister, M.D., Edinburgh. (Pp. 209-213.)

In this age of theosophy and occult questions, the account of the case of J. C. (pp. 142-153) will stir anew the speculation as to the possible existence of a dual life. Many of us certainly find that one occupies us sufficiently, and would feel like echoing the half-sarcastic question by Dr. North at the end of the narrative: "Are there ever three?" If there were, it is likely that we should all wish to resign, for even Dr. Jekyll might quail before this intricacy.

The special value of these "Characteristics" probably lies in their fidelity to practical observation and in their reflex action upon other medical men. We seem to see the earnest, conscientious, and brilliant personality of the author adapting itself to a thousand emergencies of human suffering; we feel the pulse of his magnetic sympathy beating warmly for those oppressed by physical and mental ills. If the history of his varied experience shall lessen the sum of human woe, it will accomplish a noble purpose and add yet more to the lustre which has long been attached to the name of this distinguished physician.

M. M. C.

RECENT WORKS ON GYNECOLOGY.

TREATISE ON GYNECOLOGY, MEDICAL AND SURGICAL. By S. POZZI, M.D. Translated from the French edition by BROOKS H. WELLS, M.D., of New York. In two volumes. New York: Wm. Wood & Co., 1891.

A SYSTEM OF GYNECOLOGY. [POZZI'S.] Revised by CURTIS M. BEEBE, M.D., of Chicago. New York: J. B. Flint & Co., 1892.

SURGICAL DISEASES OF THE OVARIES AND FALLOPIAN TUBES, INCLUDING TUBAL PREGNANCY. By J. BLAND SUTTON, F.R.C.S. Philadelphia: Lea Brothers & Co., 1892.

DISEASES OF WOMEN: A MANUAL OF NON-SURGICAL GYNECOLOGY. By F. H. DAVENPORT, M.D., Instructor in Gynecology, Harvard Medical School. Philadelphia: Lea Brothers & Co., 1892.

IN THE AMERICAN JOURNAL OF THE MEDICAL SCIENCES for April, 1891, p. 391, our reviewer remarked: "We are not aware of any more scholarly, comprehensive, or intelligible treatise upon gynecology in the history of its literature." This applied to Professor Pozzi's book in its original form. The truth of this sentence has been exemplified by the rapid adoption of the book by gynecologists, and the translations which are in common use among those who do not read French. Of these translations, that of Dr. Wells is the more extensive and the better. The publishers have produced two large volumes, well and clearly printed, and abundantly and handsomely illustrated. This translation is to-day the best work on gynecology available in English, and while its position may be disputed within a few years by some American text-book, still our remark must hold good for at least a considerable time. There is but one disadvantage to the translation of Dr. Wells, and that is that its cost and size are such as to make it inaccessible to the average student. It is true that it is not a student's book, but operations are so well described and illustrated that a student can greatly profit by its perusal.

DR. BEEBE's version of the same book is an effort to bring it within the means of the average practitioner and student. The result is not, of course, what is to be desired, but it is better than doing without so excellent a book. Dr. Beebe's volume is well printed, and while its illustrations are not remarkable for excellence, still they assist in understanding the text.

THIS work of Mr. Sutton's is the clearest book which has yet been written upon a most obscure subject. The author, with refreshing keenness, disclaims the egoism which characterizes so much of the literature of gynecology, and records the work of others and his own observations. There is in this book a maximum of fact and a minimum of opinion, a "consummation devoutly to be wished." It follows naturally that the book is the best upon the subject which has yet appeared. It contains numerous and good illustrations, several of them in colors. It is well printed and of convenient size.

It has been remarked that there are several ways of reviewing a book; one, by telling what is in the book, to condemn or agree with it; another consists in telling the character of the book, leaving the reader to profit by its personal perusal. We do not care to restate Mr. Sutton's beliefs regarding disputed points in the pathology of the ovaries. The reader would gain nothing by such statement, but we prefer to add our testimony to that of those who have read the book, as to the fidelity of observation, clearness of statement, and unbiased influence. We wish that a future edition may be made larger, and that some points may be discussed more in detail. As the book at present stands, it is so available in size and form that no one interested in gynecology can well avoid reading it, and no one who does read it can fail to honestly profit by it.

DR. DAVENPORT'S book is the second edition of an excellent work; it is the best of its kind which we have seen for the student and the junior practitioner, and even men of longer experience can well profit by its perusal. In the present edition, diseases of the tubes have been more fully treated, and the chapter on "Pelvic Peritonitis and Cellulitis" has been thoroughly rewritten. The book is valuable in impressing upon the student the fact that many ailments do not require surgical operations for their relief. It may well form a text-book of minor gynecology in medical colleges.

E. P. D.

MATERIALISM AND MODERN PHYSIOLOGY OF THE NERVOUS SYSTEM. By WILLIAM H. THOMSON, M.D., LL.D. 8vo., pp. 112. New York: G. P. Putnam's Sons.

PROFESSOR THOMSON has given to the public, in book form, the substance of an address recently delivered before the Philosophical Faculty of Columbia College. The little volume shows signs of having been the result of deep thought and careful study of the physiology and pathology of the nervous system.

The problem of mind and matter is taken up and discussed from the standpoint of the biologist, with many references, critical and otherwise, to the treatment of the same subject by other scientists, notably Prof. Huxley and Dr. George Romanes.

In common with Prof. Tyndall, Sir William Thomson, and Dr. Hughlings-Jackson, the author objects to the materialistic idea that consciousness is but a function of brain matter—inferring, rather, that it is a reality apart, though manifesting itself through the brain mechanism.

The volume is neatly bound and contains a number of clear, full-page illustrations of the evolution of the brain.

F. W.

PROGRESS

OF

MEDICAL SCIENCE.

THERAPEUTICS.

UNDER THE CHARGE OF

REYNOLD W. WILCOX, M.A., M.D., LL.D.,

PROFESSOR OF CLINICAL MEDICINE AT THE NEW YORK POST-GRADUATE MEDICAL SCHOOL
AND HOSPITAL; ASSISTANT VISITING PHYSICIAN TO BELLEVUE HOSPITAL.

THE TREATMENT OF CHOLERA BY CHLOROFORM.

DR. DESPREZ, after an experience of twenty-five years, recommends a compound mixture of chloroform in this disease. He finds—1, that his mixture calms the gastric spasm which prevents the ingestion of medicine and food; 2, that it actively stimulates the functions of the skin, which are so closely allied to those of the alimentary canal and kidneys; 3, that he can introduce into the economy, when absorption is possible, substances capable of reëstablishing the normal composition of the blood, and the remedies destined to render it more fluid, and which fit it to enter the capillary circulation and make it susceptible to hæmatosis. His formula is: chloroform, 1; alcohol, 8; acetate of ammonia, 10; water, 110; syrup of the hydrochlorate of morphine, 40. Of this the dose is a tablespoonful every half-hour. He claims, by this treatment, 80 to 90 per cent. of cures, laying special emphasis upon the toxic effect of chloroform upon the microorganisms of this disease.—*L'Union Médicale*, 1892, No. 110, p. 409.

THE TREATMENT OF ACUTE DYSENTERY BY SULPHATE OF SODA AND THE INTESTINAL ANTISEPTICS.

DR. E. GRUET, rejecting ipecac and calomel because they possess such properties that they will be only employed in exceptional circumstances, believes that in the combination of sulphate of soda, which, used alone, acts slowly and is efficient only in certain forms of this disease, with intestinal antiseptics he has found a satisfactory solution of the problem. Two and one-half drachms of sulphate of soda, in about seven ounces of water, are taken in four portions each day, at intervals of three hours. Seven grains of naphthol are administered in wafers at intervals of three hours, each dose to be followed by several swallows of milk. If this remedy is not well borne salol is to be substituted.

Each afternoon an injection of either boric acid, 20 ; or naphthol, 0.25 ; or carbolic acid, 0.50 ; to warm water, 1000, is to be given ; a quart being a suitable quantity. A milk diet is insisted upon during the entire treatment. This method should be continued until the stools again show their normal consistence and composition. Certain precautions should be observed : if deep ulcerations are suspected, one pint of injection is sufficient ; boric acid, with which this treatment is commenced, may produce a desquamation of the mucous membrane, therefore it should be used once only in four or five days, either naphthol or carbolic acid taking its place on the intervening days ; at the end of treatment nitrate of silver, in one-fifth of a one per cent. solution, yields good results. Accessory methods are : warm fomentations of camphorated oil of chamomile over the abdomen, a laudanum-starch enema toward evening to relieve tenesmus and allow sleep.—*Bulletin général de Thérapeutique*, 1892, xxviii., p. 88.

THE ANTI-EMETIC ACTION OF MENTHOL.

DR. R. BLONDEL has recognized this action of menthol for the past five years, regarding it, with carbonic acid, as the most surely anti-emetic of those with which he is acquainted. He notes that both of these remedies are stimulants to the stomach, powerful adjuvants to gastric contraction, and frequently employed in moderate dose to stimulate sluggish muscular work of the stomach ; that with the use of menthol, nausea and gastric spasm can be stopped at such a point that even ipecac loses its power of producing emesis. He seems to believe that the active stimulant effect of these remedies is produced on contracted muscular fibre. He utilizes this property of menthol in the treatment of dysentery by ipecac, when he administers with it every two hours a fifth of a grain of menthol dissolved in alcohol, to which a smaller quantity of saccharin is added.—*Nouveaux Remèdes*, 1892, No. 17, p. 399.

MENTHOL IN VOMITING OF PREGNANCY.

DR. MORIZ WEIL, recalling the work of Gottschalk, Weiss, Lahnstein, Drews, Graefe, Kaltenbach, Lomer, Jaffe, Piza, and May, concerning the use of this drug for vomiting, records its successful use in a case under his own observation, in which muriatic acid, bicarbonate of soda, ice, cherry-laurel water, morphine, bromide of soda, hyoscyamus, chloral, and cocaine had failed. The formulæ employed have been those of Gottschalk (menthol, 1 ; alcohol, 20 ; distilled water, 150 ; a dessertspoonful every two or three hours) ; of Weiss (menthol, 1 ; alcohol, 20 ; syrup, 30 ; which makes a better solution) ; of the author (10 drops of a 20 per cent. solution in olive oil, dropped in finely-powdered sugar), the last formula leaving only a sweet taste in the mouth, after a little water has been drunk. The dose of menthol for this purpose is about a grain.—*Centralblatt für die gesammte Therapie*, 1892, Heft 8, S. 449.

THE DIET AND TREATMENT OF BRIGHT'S DISEASE.

M. SEMMOLA, at a meeting of the Academy of Medicine, records his experience of forty-two years, as follows : 1. The quantity of albumin eliminated

during twenty-four hours is considerably modified by diet. 2. Under the influence of an exclusively meat diet the quantity of albumin eliminated during twenty-four hours increases considerably, even to twofold. 3. Under a vegetable and starchy diet the albuminuria diminishes considerably, even to a third part of that formerly excreted under a mixed diet. He states that, whether from the action of toxines or from failure of elimination of albuminoids, or from both of these causes combined, as a result of his experience he regards milk as the typical food and at the same time a remedy for the albuminuria of Bright's disease.—*Bulletin de l'Académie de Médecine*, 1892, No. 37; p. 455.

A SUGGESTED BASIS AND GUIDE FOR MEDICAL TREATMENT BY ELECTRICAL ENERGY.

PROF. WILLIAM J. MORTON has presented a very scientific paper. In deciding upon some rational method of applying electrical energy to combat disease, he classifies its results from a physiological point of view, as due to the contractile effects of electric currents upon animal protoplasm, or upon vasomotor effects and upon the phenomena of electrotonus; or the practitioner may confine his treatment to ascending or descending currents; or he may turn to chemico-physical effects, and may base his treatment upon electrolysis, polar and intra-polar, and upon cataphoresis; or, finally, he may adopt a clinical basis, which may be stated: that the purposes which electricity may serve, are—sedative, stimulant, counter-irritant and vesicant, muscle-contractive, anti-spasmodic, tonic, promotor of development, absorbent, chemical cautery, coagulator, electrolytic, hæmostatic, promotor of hemorrhage, decongestor, and as a medicator. In attempting to solve its undoubted and powerful action for good in disease, in the chemical life-history of the cell may be found the hypothesis which shall serve as the basis for exact electrical treatment. If chemical affinity in the cell may create a potential difference and an electro-motive force in the tissues, then external (medical) electro-motive force and electric current may, in turn, promote or arrest in the same tissues that chemical affinity (nutritional) which in the first instance was capable of creating potential difference, and resulting animal current. He concludes that disease exhibits polarity, which may be augmented or counteracted by an applied current, and thus the disease be augmented or counteracted; that the future electro-therapeutist will ascertain the polarity of the part to be treated by electricity, and that this index will provide an invariable guide to treatment, and thus electro-therapeutics may be reduced to an exact science.—*New York Medical Record*, 1892, No. 1139, p. 265.

STRONG HYDROGEN PEROXIDE SOLUTIONS LOCALLY IN DIPHTHERIA.

DR. FRANCIS H. WILLIAMS, in his usual careful manner, presents a very valuable contribution to our resources in treating this formidable disease. The problems are to kill the bacilli within a few seconds, and to do this without harm to the patient. These conditions fulfilled, it would be necessary to find the means of bringing the peroxide to the vital point, and to preserve the solution. To cleanse the throat merely, and as a gargle, a fifteen-volume solution (2.4 per cent.) will answer, but when the membrane is thick

and tough, it is necessary to use a solution from fifty to two hundred volumes (8 to 32 per cent.), in order to have it efficient. As soon as the peroxide touches the dead tissues it begins to decompose into oxygen and water, attacking and disintegrating the membrane, and so opening up the way for farther germicidal action. A special atomizer and syringe is designed, the former somewhat resembling the Rumbold spray tube, with which applications can be made as often as required. The syringe can be used for a day or so, from one to three times, and afterward the spray will be generally sufficient. The stability of the solutions varies much, according to their strength; in a cool, dark place, or in a refrigerator, the time of permanency is prolonged. The two hundred volume will keep for six days in a refrigerator, with a loss of only eight volumes. He summarizes as follows: 1. The peroxide of hydrogen has the unique and necessary quality of disintegrating the membrane, and thus rendering the bacillus accessible. As it only attacks dead organic matter the healthy tissues are not lacerated, as is the case when mechanical means are used to remove the membrane. 2. The acid peroxide of hydrogen solution is an effective germicide against the bacillus of diphtheria, and is not toxic to the patient. 3. The syringe is simple in construction; it can be kept perfectly clean, and is not attacked by solutions which quickly corrode metals; with it one can easily reach all parts of the throat which are to be seen without a mirror.—*Boston Medical and Surgical Journal*, 1892, No. 127, p. 303.

THE LOCAL ANTISEPTIC TREATMENT OF PULMONARY PHTHISIS BY GASEOUS INHALATIONS OF IODOFORMED OR IODOLATED ESSENCE OF TURPENTINE.

DR. DELTHIL, under this somewhat formidable title, presents a very instructive study of the following remedies in a mixture: essence of turpentine, 350; of spikenard, 100; iodol, 8-10, or iodoform, 8-10, and sulphuric ether, 20, inhaled from a bottle, through a tube furnished with a mouth-piece. He says: 1. This treatment is physiologically indicated in obtaining asepsis by means of non-toxic gaseous antiseptics. 2. These remedies meet these requirements. 3. Their absorption is proved by urinary examinations. 4. The secretions and cough diminish, the appetite improves, and, without accidents, success follows. 5. This treatment is not at all exclusive, but permits of using other approved dietetic, therapeutic, and hygienic means.—*Journal de Médecine de Paris*, 1892, No. 37, p. 426.

THE MONOCHLORIDE OF PHENOL.

DR. CH. ELOY writes of this remedy, more especially of its use as a pulmonary antiseptic. It is a chlorinated combination of phenol obtained by passing chlorine gas into a mixture of phenol with an alkali. It differs from the trichloride of phenol in that it is liquid, is of less odor, and but slightly caustic. It is a dense volatile liquid, the vapors of which are heavier than the air, and its antiseptic power four times greater than that of phenic (carbolic) acid. It mixes with other soluble antiseptics, and has a more agreeable odor than menthol or thymol. It is employed as an antiseptic remedy in chronic

bronchitis, pulmonary gangrene, bronchorrhœa, and pulmonary tuberculosis—the high specific gravity of its vapor guaranteeing its penetration to the finest bronchioles, and favoring its absorption. It diminishes the expectoration, its purulence, its fetor, and as well the number of microbes which it contains. At the same time it lessens the cough, fever, and the sweating. Rigid hygienic treatment and *sur-alimentation* are important. It is inhaled from a flask provided with two tubes, the one containing cotton upon which the liquid is placed, the other for the aspiration of the medicated air by the patient. The daily dosage is twenty to thirty drops, inhaled several times each day. The true value of this new acquisition can only be ascertained from a more extended use.—*Revue générale de Clinique et de Thérapeutique*, 1892, No. 31, p. 488.

THE TREATMENT OF THE PNEUMONIAS OF DIABETICS.

DR. CH. ELOY, following Marchal, insists upon the hygiene of the skin as a prophylactic measure—dry frictions, weekly sulphur baths, massage—the observance of a diabetic diet, the use of tonics, residence in a climate where the air is not moist nor the temperature variable. Blisters should be avoided, as erysipelas may follow, or nephritis result from the absorption of the cantharidine; the antimonials for internal use are contra-indicated. The dyspnœa will be relieved by oxygen inhalations; renal insufficiency, by caffeine, which also benefits the pulmonary congestion, the asthenic conditions, and threatening collapse. As it is necessary at all hazard to nourish the patient, the lactose of the milk is ignored, and a lacteal diet insisted upon to aid diuresis and assist in the elimination of toxins. In spite of the dangers of acetonuria, alcohol and strong wines are prescribed. Antipyretics, as quinine, antipyrine, are prescribed not only on account of their effect upon the temperature, but if not upon the glycosuria, at least upon the polyuria. In lamenting the paucity of resources at our disposal for treatment of special indications, we must remember it is the diabetes that is to be considered, and bear in mind to treat the pneumonias which arise in diabetic subjects.—*Revue générale de Clinique et de Thérapeutique*, 1892, No. 36, p. 561.

THE COMMERCIAL HYPHOSPHITE PREPARATIONS.

MR. FRANK X. MOERCK has analyzed seventeen preparations found in the Philadelphia market, by the mercuric chloride method. The amount of hypophosphite found, expressed in terms of free hypophosphorous acid per fluid-ounce, varied from a trifle over one-third of a grain to over thirty-one grains, those containing less than two grains probably owing their medicinal effect to the alkaloids of quinine and strychnine rather than to the small quantity of the hypophosphites. The compound syrup of the *National Formulary* contains over twenty-two grains to the ounce. Of the army of special preparations placed upon the drug-store shelves through the conversion of practitioners by free samples, several excite the suspicion that they never contained the quantity of salts which the labels state to be present. It is to be hoped that physicians can be convinced that there are preparations which can be made by the authority of the *Pharmacopœia* and *National Formulary* which shall

contain as much of the remedial agents in an ounce as some of their favored specialties contain in a pint.—*American Journal of Pharmacy*, 1892, No. 8, p. 393.

THE TREATMENT OF INFECTIOUS BRONCHO-PNEUMONIA OF INTESTINAL ORIGIN.

DR. CH. ELOY recognizes the necessity of intestinal antiseptics, which he obtains by the preliminary use of calomel followed by benzo-naphthol or betol in appropriate doses; or if the child is of suitable age to take wafers, salol or naphthol, with powdered charcoal, can be used. As remedies to place the organism in the best condition of resistance to this infection, he uses tonics, wines, preparations of kola and quinquina. The symptomatic indications are fulfilled by dry cupping, blistering by cantharides, caffeine, ether injections, hot applications, stimulating frictions, warm baths. The prophylactic medication embraces isolation of the patient, sterilization of the dejecta and linen, disinfection of the bedding and of the apartment. —*Revue générale de Clinique et de Thérapeutique*, 1892, No. 28, p. 437.

THE RESISTANCE OF THE BACILLUS OF INFLUENZA TO PHYSICAL AND CHEMICAL AGENTS.

PROF. G. TIZZONI has carried out some experiments in his laboratory, and has obtained important and interesting results. At a temperature of from 134° to 140° F. the bacillus is resistant for five to ten minutes; at 122° to 134° F., for ten to fifteen minutes, and at 113° F. it preserves its vitality for at least an hour; in aqueous vapor at 208° to 212° F. it is destroyed in one minute. At a temperature of -4° to -13° F., it is living for at least fifteen minutes; at 32° F. it preserves its vitality for a long time. With rapid desiccation it is resistant for twenty-six days; with this process carried on slowly it can be preserved up to seventy days or even longer, depending upon the rapidity of the abstraction of water. Under the action of light it perishes in between ninety-six and one hundred and forty-four hours. Among the chemical agents, as regards efficacy, sublimate stands in the first place, the strength being one-tenth of one per cent., and phenic acid two per cent., both, however, being acidulated with hydrochloric acid in the proportion of four-one-hundredths of one per cent. Next comes nitrate of silver, one per cent. Caustic potash, at five per cent. can be compared with nitrate of silver at one to two per cent., is always a good disinfectant and has a practical advantage. Of the mineral acids, sulphuric and nitric showed themselves to be weaker than hydrochloric and acetic. Last of all in efficiency come resorcin and absolute alcohol. Boric acid at five per cent. and chlorate of potash at one and a half per cent. were not of any evident value.—*La Riforma Medica*, 1892, No. 110, p. 412; and No. 111, p. 424.

GÜNZBERG'S TEST IN THE TREATMENT OF CHRONIC DYSPEPSIA.

MR. A. SYMONS ECCLES, basing his conclusions upon the experiments of Dr. Tolcher Eccles, which showed that in twenty cases the average time elapsing between the injection of Günzberg's capsule, swallowed one hour

after a test meal, and the appearance of the iodide in the saliva was 78.5 minutes, has been much impressed with increase in the limits of the stomach, as ascertained by palpation, percussion and succussion, in chronic dyspeptics who have not been relieved by drugs and dietetics. In these cases the salol test shows delay, so that careful observation is required to ascertain whether there exists organic dilatation. The rate of absorption may be determined by Penzoldt's test of iodide of potassium, or Brunton's, of powdered rhubarb. Having thus learned if there is any delay in absorption, the digestive activity is ascertained by means of Günzberg's capsule. This test is not always applicable, and merely serves as an approximate test of the quality of the gastric secretions by comparison between its behavior under normal and abnormal states of the stomach. It will not afford any useful information when the deviation from the normal is slight, but it will assist the observer's appreciation of the degree of digestive activity, and on repetition will show whether the course of treatment adopted is likely to prove successful. The utility of this test is perhaps more limited than those which are employed for observing the character of the evacuated contents of the stomach; but it is less cumbersome and irksome, and is not fraught with the dangers which attend the use of a stomach tube. In functional diseases it seems to have established the necessity of restricting the use of feculent matters in the dietary of persons in whom there is a delay in the reaction-time. The administration of hydrochloric acid after the test breakfast, either before or with the capsule, has appeared to influence the reaction time in favor of greater rapidity; and, again, a dose of alkaline carbonate before the test meal has sometimes, but not always, seemed to have the same effect, except in the case of malignant disease, in which it had no influence.—*The Practitioner*, 1892, Nos. 286, p. 257; 287, p. 348; 288, p. 417.

THE SUCCINIMIDE OF MERCURY IN THE TREATMENT OF SYPHILIS.

M. JULIEN has communicated to the Société de Thérapeutique the results of the treatment of syphilis by subcutaneous injections of this salt of mercury. This remedy is prepared by treating the succinimide by the red oxide of mercury in the presence of boiling water, and it is obtained as a crystalline salt in long, white needles, very soluble in water and alcohol. A quarter of one per cent. solution is used of which seven to fifteen drops is given for an injection, which is not painful nor irritable, provided the salt prepared by the distillation of the succinate of ammonia is not used. He has made 581 injections in 26 cases of syphilis, especially in the secondary period, which have been well borne, even when repeated each day. If this remedy is administered in pill form it is necessary to not only increase the dose but also to continue it for a longer time.—*Les Nouveaux Remèdes*, 1892, No. 8, p. 178.

THE TREATMENT OF DYSPNŒA.

DR. EM. TOURNIER classifies the causes of dyspnœa as cardio-pulmonary, cardio-hepatic, and cardio-paretic. He places the toxic dyspnœas under the heading of cardiac dyspnœas, more particularly of arterial origin. The cardio-pulmonary dyspnœa, a dyspnœa of mechanical origin, when the phe-

nomena of pulmonary stasis are predominant is relieved by mild revulsives, or cupping, sinapisms as applied to the chest, rest, digitalis after a few days of a milk diet preceded by a saline or drastic purgative. Venesection, eight to ten ounces, may exceptionally be required. The digitalis should be administered in large doses, and should not be long continued; even better is the use of digitaline in that the action is more rapid. With cardiac disease, particularly of the arterial variety with active pulmonary hyperæmia, digitalis must be avoided, and intestinal derivatives and counter-irritation over the chest be made use of. In dyspnœa of nervous origin varying modes of treatment must be employed; morphine given hypodermatically, especially in the paroxysmal dyspnœa of those suffering from aortic disease. Albuminuria is not in this instance a contra-indication to its use, but a condition demanding that it be used prudently. In the dyspnœas of toxic origin the food must be as free as possible from substances producing ptomaines, eliminating those already in the intestines, and preventing them from entering the blood. The first indication is best fulfilled by milk, two to three quarts daily. Keeping the kidneys in activity—diuresis—meets the second, while the third indication demands intestinal antiseptics, which diminishes the work of the liver in its destruction of ptomaines that are produced. Here benzo-naphthol is a powerful agent to prevent fermentation, and, at the same time, according to Huchard, slightly diuretic. If the attack is very violent, cupping, injections of morphine, inhalations of oxygen, or especially inhalations of iodide of amyl, associated or not with chloroform, may be required. Besides, not only is the dyspnœa treated, but the causative pathological condition of which this is a symptom, the arterial sclerosis, must receive methodical and persevering treatment by the iodides.—*Revue générale de Clinique et de Thérapeutique*, 1892, No. 29, p. 449.

CITRIC ACID FOR THE STERILIZATION OF WATER DURING EPIDEMICS OF CHOLERA.

DR. J. DE CHRISTMAS, reviewing the bacteriological work, recommends the addition of 1 per cent. of citric acid to the water, which should be kept in porcelain receptacles. Water so prepared has an acidulous and pleasant taste, and can be employed pure, or mixed with wine or syrup, or it can be used for culinary purposes.—*La Médecine Moderne*, 1892, No. 38, p. 577.

The following papers are worthy of notice:

"The Treatment of Epilepsy by Convulsants," by M. PIERRET, *Le Mercredi Médical*, 1892, No. 40, p. 473. Mentions the attenuated virus of hydrophobia, picrotoxine, atropine, hyoscyamine, and strychnine.

"The Régime and Treatment of the Albuminurias," by M. DUJARDIN-BEAUMETZ, *L'Abeille Médicale*, 1892, No. 41, p. 321. Advises diuretics, purgatives, stimulating the functions of the skin, intestinal antiseptics by benzoate of naphthol, vegetable diet, milk.

"The Sodium Chloride Infusion in Cholera," by DR. J. MICHAEL, *Münchener medizinische Wochenschrift*, 1892, No. 39, S. 692.

"The Treatment of Cholera," by DR. A. CANTANI, *Berliner klinische Wochenschrift*, 1892, No. 37, S. 913. An exhaustive paper.

"Concerning the Protective Inoculation Against Cholera," by DR. G. KLEMPERER, *Berliner klinische Wochenschrift*, 1892, No. 39, S. 969. Gives the results of carefully carried out experimental work.

MEDICINE.

UNDER THE CHARGE OF

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A CASE OF TUBERCULOMA OF THE CEREBRAL PEDUNCLES, WITH
MONOCULAR DIPLOPIA.

BOUVERET and CHAPOTOT (*Revue de Médecine*, 1892, No. 9, p. 729) have reported the case of a domestic, twenty-two years old, without a family or personal neurotic history, who had smallpox at two years, and breaking-down lymphatic glands in the neck in later childhood. A year before coming under observation, after exposure to cold, menstruation was absent for two periods, though hæmoptysis occurred several times. Some five months later the woman had some acute disease of the lung, which lasted for four months. Two months previously to coming under observation weakness of the left side of the body appeared, with which became associated derangement of vision, frequent paroxysmal headache, vomiting, and vertigo. The weakness progressed to complete hemiplegia. The lower portion of the left side of the face was paralyzed. Sensibility was affected equally with motility. There was slight ptosis upon the right, while on the left all the ocular muscles were affected. On closing the right eye it was discovered that two images were seen with the left eye. This phenomenon persisted for three weeks. The acuity of vision was, however, not sensibly diminished. Both sides presented commencing but well-characterized optic neuritis. After a month the patient had a convulsion involving the left side of the body, and particularly the upper extremity; this was followed by a syncopal state that lasted for fifteen or twenty minutes. When consciousness returned the palsy of the left side was more marked than it had been. The optic neuritis advanced; small hemorrhages occurred in the course of the retinal vessels. The right third nerve became paralyzed. Choreiform movements appeared in the extremities upon the right. As the symptoms advanced the intelligence became obscured, and the patient ultimately succumbed. At the autopsy the lungs presented the lesions of an ancient tuberculosis. In the left cerebral hemi-

sphere, at the level of the foot of the second frontal convolution, and at the junction of the white and gray matter, was a small, circumscribed, caseous mass, scarcely as large as a cherry-stone. Section of the cerebral peduncles disclosed the presence of two caseous masses as large as a hazelnut, one occupying the right peduncle, which it had almost entirely destroyed; it extended toward the posterior horn of the lateral ventricle and beneath the aqueduct of Sylvius, where it had destroyed the gray substance. The second mass occupied the median and posterior portions of the section of the peduncles, extending a little into the left cerebral peduncle.

A PECULIAR FORM OF NYSTAGMUS—CHEYNE-STOKES NYSTAGMUS.

BULLARD and WENTWORTH (*Boston Medical and Surgical Journal*, No. 13, vol. cxxvii., p. 301) have reported the case of a boy, two years old, who, more than a month after an attack of whooping-cough, had a convulsion. The child subsequently took to bed and became irritable. He could be made to take food only by considerable urging. The face became drawn and haggard. The pupils were equal and responsive to light. The temperature at no time rose above 100° F. The pulse was rapid and feeble. The bowels were constipated. Slight twitchings of various muscles of the face and forearm appeared. Finally, horizontal nystagmus, with Cheyne-Stokes rhythm, manifested itself. Stupor developed; the patient became comatose, and death took place. An autopsy could not be obtained. The nystagmus was horizontal and began with rapid movements, the oscillations becoming progressively longer and more extended to a certain point, and then diminishing in the same manner; a pause then ensued, which was followed by a repetition of the previous rhythmical movements. The condition continued for a few moments, but recurred more or less constantly throughout the day. There was no Cheyne-Stokes breathing. It is held that the nystagmus observed bears an analogy to Cheyne-Stokes breathing, both in character and causation. It seems probable that it is to be explained by a constant or chronic irritation of the oculo-motor centres, occurring at a time when these centres are depressed and so weakened as to be irritable in their response.

INFUSORIA IN THE SPUTUM OF PULMONARY GANGRENE.

STRENG (*Fortschritte der Medicin*, Bd. x., No. 9, p. 757) has reported two cases of pulmonary gangrene, and adds a note of the third, in which he succeeded in finding infusoria in the yellowish offensive plugs contained in the expectorated matter. The infusoria were oval, apparently structureless cells, about as large as colorless blood-corpuscles. At one pole of each cell were a number of actively moving cilia, each as long as the body of the cell itself. As a result of the movement, the cell underwent changes in shape. Frequently a process was sent out from the pole of the cell to which the cilia were not attached. The organisms died after the sputum had stood for from six to eight hours. They were only in the plugs. By cleansing the mouth with a 5 per cent. solution of potassium chlorate before receiving the sputum into a sterilized vessel receptacle, and then carrying the plugs by means of a platinum needle over into bouillon, which was placed in a thermostat at a

temperature of 98.6°, it was possible to cultivate the organisms artificially. In a few days the bouillon became turbid and developed a most offensive odor. Examination showed that the infusoria had largely multiplied. The greatest number had formed by the fourth or fifth day; subsequently their number diminished, and by the eleventh or twelfth day they had largely disappeared. The organisms were best observed by squeezing one of the plugs between a cover-glass and a slide, and using an oil-immersion lens. In the course of the examination a drop or two drops of solution of iodine, to which was added sufficient of tincture of iodine to make a dark-brown color, was permitted to flow beneath the edge of the cover-glass. The organisms at once succumbed, the cilia separating from the body of the cell, both, however, staining a yellowish color.

ERYTHROMELALGIA.

GERHARDT (*Deutsche medicin. Wochenschr.*, 1892, No. 39, p. 866) has reported the case of a tailoress, forty-four years old, who had been ill a good deal and had had considerable headache, with loss of hair. Menstruation appeared late, and was irregular. There were frequent attacks of gastro-intestinal catarrh, often with severe gastralgia. Vomiting was frequent, and on two occasions there had been hæmatemesis. The bowels were habitually constipated. There was palpitation of the heart. Micturition was increased in frequency and volume. For ten years there had been vertigo, intensified in paroxysms. The patient was one night suddenly awakened from sleep by intense pains in the fingers and toes, with vomiting and headache. The pain persisted with varying intensity. The hands were red and swollen and perspired readily. There was also an undue tendency to perspiration about the head. The feet were also red and swollen. The terminal and middle phalanges of the hands and feet were moderately enlarged. These parts felt hot, were often covered with sweat, and at times presented a tense, glossy appearance. The swollen parts were unduly susceptible to painful impressions. The fingers were usually held in semi-flexion; attempts to extend them occasioned pain.

Gerhardt summarizes the symptoms presented by the fourteen other cases of the disease that have been reported in the literature. The name erythromelalgia was given by Mitchell. The affection seems principally to affect persons that are much exposed to cold. Other antecedent conditions have been over-exertion, debility, a neurotic disposition, rheumatism, and syphilis. The disease has been observed more commonly in males than in females, and between twenty-eight and forty years than at any other period. Pain is the most prominent symptom, and usually the first; swelling appears subsequently. The pain is usually described as hot or burning, and as worse in warm weather. It is increased by movement and is mitigated by cold. In most cases the lower extremities are involved, sometimes only one; sometimes only the upper, at other times all four. The veins of the affected parts are usually enlarged, together with which there are often redness and swelling. In most cases there occur paroxysmal exacerbations, while during the intermissions there is entire freedom from symptoms. The disease is rather rebellious to treatment.

THE PRESENCE OF AMMONIA IN THE GASTRIC JUICE.

ROSENHEIM (*Centralblatt f. klin. Medicin*, 1892, No. 39, p. 817) has shown that under various normal and pathologic conditions the gastric juice contains not inconsiderable quantities of ammonia, in combination, as ammonium chloride. Its presence was determined by the following method: The recent contents of the stomach, removed by the tube, were filtered; 10 c.cm. (about two drachms and a half) of the filtrate were dealbuminated by carefully neutralizing and adding a concentrated solution of tannic acid in acetic acid, drop by drop, until no further turbidity resulted. On again filtering, the fluid was generally clear; if not, it was again carefully neutralized and treated with the solution of acetic acid and tannic acid until all the albumin was precipitated. By the method of Salkowski, it was demonstrated that a certain quantity of ammonia was present in the gastric juice of healthy persons, and of others with disorders of the stomach, at all stages of digestion and after the ingestion of the most varied food.

IMMUNITY TO CHOLERA.

By treatment with subcutaneous inoculations of cultures of cholera-bacilli, G. KLEMPERER (*Berliner klin. Wochenschr.*, 1892, No. 39, p. 969) has succeeded in conferring upon man immunity to cholera, as indicated by the protective influence of the blood-serum of the immune individual upon guinea-pigs in a degree proportionate to the virulence of the protective inoculation. He was also able to demonstrate that some persons possess a natural immunity to cholera—much less in degree, however, than the immunity artificially conferred.

CRITICAL PULMONARY ŒDEMA IN THE COURSE OF CROUPOUS PNEUMONIA.

KORNFELD (*Centralblatt f. klin. Medicin*, 1892, No. 37, p. 777) calls attention to the possible occurrence of a critical pulmonary œdema of angio-neurotic character, in the course of pneumonia terminating in recovery, and reports an illustrative case. An alcoholic, thirty-seven years old, came under observation with profound but obscure symptoms, which were cleared up by the development of the signs of a wandering pneumonia. The attack was marked by an extensive eruption of herpes, but the action of the heart was well maintained throughout. On the seventh day the crisis appeared, with the development of a transitory pulmonary œdema. In the course of a few hours the threatening symptoms had subsided, the patient expectorating considerable quantities of thin, frothy, prune-juice matter. Improvement was thenceforth progressive, and the patient was soon after convalescent.

ULCERATIVE ENDOCARDITIS CONSECUTIVE TO GONORRHOEA.

HIS (*Berliner klin. Wochenschr.*, 1892, No. 40, p. 993) has reported the case of a man, nineteen years old, who, shortly after apparent recovery from an attack of gonorrhœa of but ordinary intensity, was seized with a chill, followed by an eruption of small, reddish spots on various parts of the body,

some of which were hemorrhagic. The heart became increased in size, and a loud, blowing systolic murmur, previously not detected, could be heard at the apex, but with greatest intensity in the course of the aorta. The temperature rose to 104.9°. The febrile movement was remittent. The urine was excreted in increased quantity, but contained no abnormal ingredients. At no time was there pain in the perineum or testicles. The patient grew progressively worse and died from heart-failure. At the post-mortem examination hemorrhages were found beneath the skin and the various mucous and serous membranes, and in the lungs, liver, testicles, cerebellum, and medulla oblongata, while the spleen, kidneys, and lungs contained infarcts. Thrombi were present in the pubic plexus of veins. The heart was enlarged, the left ventricle hypertrophied. Upon the right aortic semilunar leaflet were seated numerous excrescences, to which masses of fibrin and recent coagula were attached. Similar masses were seated upon the anterior half of the left leaflet, and a single nodule was present upon the posterior leaflet. Here and there were small areas of ulceration. The aorta presented evidences of inflammation. The other valves and orifices were normal. Microscopic examination disclosed the existence of an interstitial myocarditis, with puriform softening of a thrombus at the apex. Gonococci were looked for in the various lesions, but with doubtful results. In the tissues of the diseased aortic valve were found organisms that bore a close resemblance to gonococci.

SUPPURATIVE PYLE-PHLEBITIS.

DR. J. S. BRISTOWE (London) gives an account of four cases of this affection, with a few remarks under the heads of symptomatology and diagnosis, etiology, and treatment. As regards etiology, old mischief about the vermiform appendix was found in one case, and some of the mesenteric veins in connection with that part contained pus. In another, marked congestion was observed about the ileo-cæcal valve. From these facts and the evidence of previously published cases (*Pathological Transactions*, vol. ix.) Bristowe is strongly inclined to trace pyle-phlebitis to intestinal ulceration. As regards solitary abscess, he speaks as follows:

"It may be asked in this connection how it is that, if I trace pyle-phlebitis to intestinal ulceration, I do not at once admit the similar connection between tropical abscess of the liver and dysentery? The difficulty I feel in regard to this question depends on the fact that such abscesses are usually solitary, and do not follow the ramifications of the portal vessels, and that their development and continuance are not, as a rule (so far as my experience goes), attended with pyæmic symptoms."—*Practitioner*, 1892, No. 292.

THE DEVELOPMENT OF BACTERIA AT LOW TEMPERATURES.

FÖRSTER (*Centralblatt f. Bakteriologie u. Parasitenkunde*, 1892, No. 13, p. 431) refers to a previous communication in which he pointed out the presence in sea-water and in sea-fish of bacteria capable both of producing light and of development at a temperature of 32° F. Pursuing the study further, he has, by means of an ice-calorimeter, succeeded in demonstrating in ordinary waters, in articles of food, in milk, in garden earth, and in refuse mat-

ters the presence of a small number of bacteria capable of existence and multiplication at a temperature of 32° F. This observation is in accord with common experience, that articles of food that are kept in the ordinary refrigerator after a few days acquire a peculiar, disagreeable odor and taste. That meat kept on ice, though preserving for weeks a normal appearance, nevertheless underwent decomposition was demonstrated by a progressive increase in the number of bacteria detected and in the quantity of ammonia and volatile alkaloids present. It was found that meat kept on ice had at the end of sixteen days undergone decomposition in a degree corresponding with that in meat kept for six or seven days at a temperature of 45.6° or 48.2°, or for two days at the temperature of the room. It thus becomes evident that cold alone does not fulfil the requirements of a perfect preservative of foods. To this end the most powerful adjunct is the removal of moisture. This fact has been demonstrated in the treatment of fish, which, placed and kept in cold, dry compartments immediately after having been caught, can be sent long distances to market, remaining fresh for an indefinite time.

SURGERY.

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SUPRA-PUBIC CYSTOTOMY THROUGH THE RIGHT RECTUS MUSCLE.

JABOULAY (*Le Mercredi Médical*, 1892, No. 36) describes a new method for constructing an artificial meatus and urethra through the right rectus muscle of the abdomen. The incision was made parallel to that used by Poncet in his supra-pubic cystotomy; the peritoneum was easily pushed upward and the bladder-wall and skin sutured by six sutures, the muscular layer being omitted. The result obtained was very satisfactory, and the author believes the method will give better and quicker results than others heretofore in vogue, the recti having apparently a strong sphincteric action, and likewise drawing the opening upward.

PYOKTANIN AS AN ANTISEPTIC.

RALDE (*Deutsche Zeitschr. für Chir.*, Bd. xxxv., Heft 1 u. 2) criticises Pohl for declaring in his inaugural address that "pyoktanin is an antiseptic of greatest usefulness, and has so proved itself on all sides." This great praise

he believes not to be warranted, for although pyoktanin possesses great and easy diffusibility, and analgesic and poisonless properties, with much germicidal power, he claims that the author touches too lightly on the slight stability of its solutions, the quick elimination, and the deep-dyeing power. He believes, also, that the statement that "its power in preventing the development of bacteria and in killing them is greater than that of any known antiseptic" will scarcely find support among even the most enthusiastic of its admirers. And he thinks its great fault lies in the fact that its staining power hides all details in a wound, and makes rational treatment of wounds impossible.

THROUGH-AND-THROUGH DRAINAGE IN CASES OF PSOITIS AND PELVIC ABSCESS.

LIBOUROUX (*Arch. Prov. de Chir.*, 1892, No. 3) gives the following method for through-and-through drainage in these cases. The anterior incision is the same as for ligation of the external iliac artery. A posterior incision is made three-eighths of an inch above the crest of the ilium midway between the anterior and posterior superior spines, cutting with its anterior third the aponeuroses of the external and internal oblique and transversalis muscles, avoiding posteriorly the transverse processes of the lumbar vertebræ. The iliac fascia is then dissected up until the finger meets a probe or other instrument passed by the anterior opening, then a fenestrated rigid-rubber drainage-tube is passed through, the ends being united and the tube held in place by safety-pins imbedded in collodion. Thorough antiseptic treatment in these cases has brought good results.

[Treves's plan of thoroughly evacuating and irrigating, sponging out the walls, and closing the abscess entirely, has been successful in a number of cases, and is undoubtedly worthy a trial. The method described by Libou-roux is practically that which has been used by surgeons in all parts of the world for many years.—J. W. W.]

THE MODERN TREATMENT OF TUBERCULAR JOINT DISEASE.

KÖNIG (*Arch. für klin. Chir.*, Band xlv., Heft 3) believes that an ideal cure in these cases is well-nigh impossible—that is, the entire removal of the disease from the system—as his investigations show that four-fifths of all cases of tuberculous joint disease have also other forms of tubercular disease.

There can be, therefore, in the majority of cases only a local healing, and he finds that only 20 per cent. of all cases amenable to local injections and surgical treatment are "curable" in that manner—that is, the tuberculous masses become encapsulated, remain latent, and the use of the joint is restored. This, of course, requires time, and in those cases in whom a speedy recovery and early use of their limbs are necessary for their maintenance, resection is indicated. The method of early resection he believes of little value, and orthopædic treatment or injections will bring about better results. There are certain cases in which the removal of the capsular ligament and tuberculous masses in the articular cartilage produces favorable results, but these cases, he believes, are mostly confined to children. In general, he sees in resection and capsule extirpation the best surgical treatment of these cases.

[König takes an unnecessarily gloomy view of the future of tubercular arthropathies. Even if his figures are correct, and four-fifths of them have tubercular disease elsewhere, which I take the liberty of doubting, improved general vitality, with the increased resistant power that comes with it, will often result in a cure which, while it may not be "ideal," is practically very satisfactory. Results in this class of cases, both by long-continued rest, with iodoform injections in appropriate cases, and by arthrectomy, are so much better than when excision or amputation were thought to be the chief alternatives, that it would be unfortunate if the impression prevailed that further work in these lines is unnecessary or useless.—J. W. W.]

THE SURGICAL TREATMENT OF GENERAL PURULENT PERITONITIS.

After a thorough discussion of the literature and statistics on this subject, (KÖRTE (*Arch. für klin. Chir.*, Band xlv., Heft 3) comes to the following conclusions: There are but a small number of these cases that can be cured, since, though we may remove the product of suppuration, we cannot, in all cases, find and remove its cause; a prognosis is, therefore, ever difficult and often impossible. Statistics are incomplete, and a true percentage of mortality cannot be deduced. Great progress would result if a distinction were always made between cases with and without adhesions. As internal treatment is so absolutely powerless, and death is so certain without surgical interference, abdominal section should always be performed, with the purpose of evacuating and draining the peritoneal cavity.

RESECTIONS OF THE SUPERIOR AND INFERIOR MAXILLÆ.

BARDENHEUER (*Arch. für klin. Chir.*, Band xlv., Heft 3) reports three cases of resection for malignant disease, and details his method of closing the wounds of the mucous membrane by a plastic operation, flaps of skin being taken from the forehead and neck and used to replace the mucous membrane removed. He claims the following advantages for the operation: The flaps completely close the mouth wounds, preventing their infection from saliva, and the consequent septic conditions that so often follow. They promote a rapid healing, the other, older methods requiring months to granulate. The passage of saliva into a resected bone often promotes necrosis; this method closes its avenue of approach. Deformities of scar-contraction are overcome, affording a greater movement to the tongue and preventing distortions. By the transplantation of skin and periosteal flaps bony union can be procured between the portions of a resected inferior maxilla and its function in a greater degree restored. In cases of cleft palate, or of resection of the superior maxilla, the abnormal communication with the nares can be closed and the normal conditions more nearly reproduced.

[Most of the evils detailed by Bardenheuer can be avoided by careful attention to the now well-known antiseptic details applicable to mouth operations; powders of boric acid or iodoform, sprays of hydrogen peroxide, occasional brushing with a weak solution of silver nitrate or zinc chloride, so as to make a superficial albuminous coagulum which prevents ptomaine-absorption until granulations have formed, will very effectually prevent

sepsis in the great majority of cases. The suggestion seems to me an example of the over-elaboration of technique now so common on the Continent, and especially in Germany.—J. W. W.]

SURGERY OF THE GALL-BLADDER.

FRAENKEL (*Centralbl. für Chir.*, 1892, No. 35) reports two cases of successful laparotomy in biliary colic. There were no calculi found, but there were present constricting inflammatory adhesions, and their removal completely cured the biliary symptoms which had been present. He believes that these cases, together with other similar ones reported, justify the belief in the power of inflammatory adhesions to produce biliary colic, and that in such cases, even where calculi are not found, exploratory interference is justifiable. Possibly, he says, in many cases the intense pain of biliary colic may be due to these inflammatory adhesions.

[In a number of recent cases the gall-bladder has been opened and drained for conditions not heretofore regarded as surgical, and in the majority of instances with benefit to the patient. In some of these there was no distention and no adhesions of moment. In still other cases, conditions thought to be malignant and irremovable were found, and the operation was abandoned, yet entire recovery resulted. Mayo Robson, in his book on *Gallstones*, records a case which is one in point. He says: "I certainly left the operating-table under the idea that the woman had malignant tumor of the pancreas, and that nothing more could be done; yet the woman recovered and regained her health." There is something more in such cases than the mere breaking up of a few adhesions, though that may undoubtedly be one factor in determining what, for want of a better name, I have ventured to call the "curative effects of operation *per se*."—J. W. W.]

FRACTURE (DISLOCATION) OF SPINE; REDUCTION; TEMPORARY¹ RECOVERY.

LANE records (*Lancet*, London, 1892, vol. ii., No. 12) the following case: W. J., aged eighteen years, was struck in the back by a heavy iron gate. On admission into Guy's Hospital he was found to have a deformity of the spine about the tenth and eleventh dorsal vertebræ, between the spinous processes of which an undue gap existed. At this time there were no evidences of injury to the cord. About two and a half hours after admission he began to complain of pain in the legs and lower part of the abdomen. At this time the legs were moved with much difficulty. Hyperæsthesia became marked, and sensation was much modified. The reflexes were exaggerated. As the symptoms were progressing, an operation was performed ten hours after the patient was admitted. A long incision was made, and the spinal muscles turned aside, when it was found that the tenth dorsal vertebra was displaced forward and slightly downward, so that the cord was compressed between the lamina of the tenth and the body of the eleventh dorsal vertebra. The cord was apparently squeezed rather than crushed. The inter-spinous ligament was torn through. As the lower articular processes of the tenth dorsal vertebra lay in front of the upper articular processes of the eleventh, the latter were cut away. After great difficulty the displaced vertebra was

dragged back into its normal position. This was effected partly by over-extending the dorsal spine, and partly by traction exerted upon the spinous process by lion forceps. As the displacement tended to recur, a stout silk ligature was passed between the spinous processes of the ninth and tenth and the eleventh and twelfth dorsal vertebræ, and by that means the tenth and eleventh spinous processes were immovably tied together. On the second day the patient's symptoms diminished slightly, and improvement continued so rapidly that at the end of two weeks he appeared to have recovered complete control over his legs, the spinous processes were in good position, the reflexes were normal. Throughout the patient was very restless, and after the wound had apparently healed, it broke down and a portion of a spinous process was discharged. Complete paraplegia soon developed. The spine was explored, when the vertebræ were found to be displaced laterally one upon the other, the cord being completely severed. This unfortunate result was due solely to the restlessness of the patient.

EXPERIMENTAL RESEARCH ON THE IMPLANTATION OF THE URETERS INTO THE RECTUM.

REED, after detailing in the *Annals of Surgery*, 1892, No. 3, a most interesting series of experiments in implanting the ureters into the rectum, presents the following conclusions:

1. That the unilateral implantation of the ureter into the rectum is a possible and practical procedure.
2. That the bilateral implantation of the vasa deferentia into the rectum is not followed by any serious or detrimental results, further than rendering the dog sterile.
3. That the simultaneous implantation of both ureters into the rectum is still a questionable surgical procedure, as shown by the experiments made on the dog, and also by Küster's double implantation of the ureters in man.
4. That the presence of the urine with the feces in the rectum does not produce pathological irritation of the latter, but that the rectum will readily accommodate itself to its presence.
5. That the passing of frequent liquid stools cannot be depended upon as resulting from implantation of the ureters into the rectum, and the presence of urine in that receptacle.
6. That these experiments have suggested the probability of a portion of the water of the urine being absorbed by the rectum, leaving the salts, etc., of the same to be eliminated from the economy with the feces.
7. That the ligation of one ureter, and the consequent production of hydro-nephrosis, is not necessarily followed by inflammation and destruction of the wall of the ureter or the substance of the kidney, and suggests one of two things: either arrest of the secreting powers of the kidney, or reversal of the natural physiological process of elimination for those of absorption.

A CASE OF MALIGNANT GOITRE TREATED BY EXCISION.

CADDY reports (*Australian Medical Journal*, 1892, No. 8) the following case: Mrs. A., aged fifty-five years, had noticed a gradual enlargement of her throat for some time before applying for treatment. Of late the growth

had been more rapid. The patient was pale and emaciated; there was some slight loss of voice, but no difficulty in breathing. She presented on the right side of the neck a tense, hard, movable swelling, which followed the movement of the larynx in deglutition, and to which was communicated a pulsation by the carotid artery lying behind it.

The growth was removed by an oblique incision extending along the anterior border of the sterno-mastoid muscle. The sterno-thyroid and sterno-hyoid muscles were thinned out to such an extent that they resembled a membrane. The superior thyroid artery was tied close to the tumor and cut. The growth and the right lobe of the thyroid gland were removed. The wound was drained, sewed with silkworm-gut, and dressed with cyanide gauze. Complete healing had occurred at the end of three weeks. Eleven months later there had been no recurrence either in the site of the former tumor or in the neighboring glands.

Microscopical examination of the tumor showed it to be cancerous beyond a doubt. There was a large amount of clear mucoid stroma; the alveoli were packed with polymorphous cells, and small cells infiltrating the stroma.

SARCOMA OF THE TONSIL.

O'HARA details (*Australian Medical Journal*, 1892, No. 8) the case of a man upon whom he operated for sarcoma of the tonsil. The patient had previously consulted several eminent surgeons, all of whom advised against operation; and on this account he did not apply again for treatment until his symptoms became urgent. Difficulty in breathing and a pronounced fetor accompanying ulceration of the tumor led him to consult the author. On examination, the growth was found to have involved not only the tonsil, but also a small area of the tongue at the root and the left half of the soft palate. The cervical glands were not indurated. Two days after the above examination dyspnoea and dysphagia were so severe that operation was resorted to as a means of possibly prolonging his life. Chloroform was administered, a preliminary tracheotomy performed, the pharynx plugged, and the cheek divided from the angle of the mouth to the anterior edge of the masseter. Having grasped the tonsil with a volsellum forceps, the diseased tissues were rapidly excised. The amount of hemorrhage was considerable. The thermo-cautery was used to destroy the edges of the wound, in case any diseased tissue had been left behind. The cheek wound was closed and dressed with styptic collodion, and the post-pharyngeal plug removed. The tracheotomy tube was removed at the end of fifty-six hours. An uninterrupted recovery followed, the patient being able to attend to business in two weeks. He remained well for four years, when evidence of secondary deposits in the apex of his right lung became apparent, and he died later of hæmoptysis.

The removal of the tonsil as practised by Cheever is accomplished through an incision along the anterior border of the sterno-mastoid muscle from the level of the ear to below the tumor. A second incision is made along the body of the lower jaw. The vessels and nerves are then retracted and the gland removed. Czerny, after dividing the cheek, saws through the lower jaw. Mikulicz makes an incision from the mastoid process to the great cornua of the hyoid bone; the soft parts and the periosteum are separated

from the lower jaw, which is sawed through and the ramus resected. Division of the lateral wall of the pharynx then gives access to the base of the tongue and palate.

The operation described by O'Hara occupied exactly twenty minutes, and he considers the method he employed superior to those above mentioned, on account of being less formidable.

[The method described by O'Hara has been used in these cases for some years. In a case of sarcoma of the tonsil operated upon at the German Hospital in this city, I found that it gave satisfactory access not only to the tonsillar region, but also to the lower pharynx, and have since employed it frequently in excisions of the tongue.—J. W. W.]

OTOLOGY.

UNDER THE CHARGE OF

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CHRONIC NON-SUPPURATIVE INFLAMMATION OF THE MIDDLE EAR.

DR. E. B. DENCH, of New York, in an analysis of cases of this disease treated in the New York Eye and Ear Infirmary, after considering the usual modes of testing hearing and the generally accepted methods of treatment, says: "As regards internal medication, the patient's general health should be kept in the best possible condition. The administration of any drug with the idea that it will improve the hearing is, of course, not to be considered, if we except, possibly, pilocarpine, as suggested by Kosegarten." In the cases in which Dr. Dench used pilocarpine, its administration was in connection with local treatment, but "the improvement seemed to be more marked after the exhibition of the pilocarpine."

"With reference to operative interference in this form of disease, I am inclined to think that the time is not far distant when we shall be able to promise better results from surgical procedures than we can at present (Sept. 26, 1891). In a somewhat limited experience in the operative treatment of these cases and of similar conditions in suppurative cases, I am in the habit of suggesting the opening of the tympanic cavity when, after a somewhat prolonged course of treatment, the impairment of hearing is unimproved or tinnitus aurium continues to be a distressing symptom. My experience has been that opening the tympanic cavity and the division of the incudo-stapedial articulation, with or without excision of the malleus, incus and tympanic membrane, will diminish the tinnitus in a certain proportion of cases, but the effect upon the hearing is much less certain." The writer of this valuable paper believes that operative interference within the tympanic cavity is devoid of all danger, and consequently no harm is done by the operation, even if it does not give any relief.—*New York Medical Journal*, vol. liv., No. 13.

OPERATIVE REMOVAL OF FOREIGN BODIES FROM THE TYMPANIC CAVITY.

DR. BEZOLD, of Munich, has written a very instructive paper upon the surgical removal of foreign bodies from the drum-cavity, by decortication of the soft tissues lining the bony auditory canal and resection of the margo tympanicus (*Berliner klinische Wochenschrift*, 1892, No. 36).

He begins his article with the very important statement that foreign bodies in the auditory canal should never form objects for attempted removal by anyone without otologically-trained eye and hand. Foreign bodies never get from the auditory canal into the drum-cavity unless pushed there by unskilful endeavors made for their removal from the auditory canal.

He then relates a case of a little girl, seven years old, who got a pebble in her external ear while at play. The rough and unskilful endeavors at removal made in a general hospital by non-otological hands, forced the pebble through the membrana tympani into the drum-cavity, where it became firmly impacted. Bezold, a most skilful aurist, was unable to move the pebble by any justifiable means through the external meatus. He, therefore, decorticated the external osseous canal, after an incision behind the auricle, and turned the latter with the cutaneous coat of the auditory canal forward on to the cheek. When a good view of the foreign body in the drum-cavity was thus obtained, it was found to be immovably impacted in the upper part of the drum-space. The margo tympanicus forming the outer boundary of the upper part of the drum-cavity was, therefore, resected and the pebble removed. The ossicles seemed to have been destroyed by the previous rough endeavors at extraction of the stone. The upper part of the incision over the auricle was sutured with three catgut stitches and the entire auditory canal tamponed with iodoform-gauze. Healing occurred by first intention.

[It is to be hoped the day is not far distant when a case of foreign body in the ear, brought to a general hospital, shall be at once referred to the aurist of the institution, without any endeavor at removal of the foreign substance on the part of the resident physicians. Such a case demands as much special knowledge as cataract, or a foreign body in the larynx.—REV.]

FURTHER COMMUNICATIONS UPON THE OPERATIVE EXPOSURE OF THE MIDDLE-EAR CAVITIES AFTER DETACHMENT OF THE AURICLE.

DR. STÄCKE, of Erfurt, under this title, presents some further explanations of the objects of this operation¹ (*Berliner klin. Wochenschrift*, 1892, No. 4). After all diseased tissue has been removed from the antrum and other parts of the middle ear, an endeavor is made to line the shallow trough formed by the operation between the antrum and the external auditory canal, with a skin-flap. For this purpose a portion of the cutaneo-periosteal lining of the auditory canal is employed, by making a rectangular incision in that part of the soft tissues of the external canal corresponding to the antrum, and pushing it into the antrum by means of a probe. "The object of this transplantation is a double one: First, to insure a persistent cicatrized communication between

¹ See review, JOURNAL for January, 1892.

the auditory canal and the antrum, and, secondly, to introduce healthy epidermis into the middle ear." This is to be attempted only in cases of chronic purulency of the antrum and middle ear. Through the perforation thus made the middle ear can be watched and treated until the cure is completed. Of 33 cases thus treated, 19 were cured, 2 improved, 2 lost sight of, and 9 were still under treatment when the article was written.

CHOLESTEATOMA OF THE MIDDLE EAR.

DR. F. SIEBENMANN, of Basle, calls attention to this very important condition of the ear, and suggests a rational treatment for it. (*Correspondenzblatt für Schweizer Aerzte*, xxi. Jahrgang, October.) He mentions the intimate causal relations existing between chronic purulent otitis media and cerebral abscess, meningitis, sinus-thrombosis, and pyæmia.

Symptoms of cholesteatoma of the middle ear are inconsiderable so long as the cholesteatomatous mass remains unmoistened. Generally, defects and distortions of the membrana tympani are found. One of the most constant symptoms is marked retraction of the membrana, usually accompanied by a small perforation in the membrana flaccida. Through this perforation, difficult to see, a probe may be passed upward into the attic space. Over the perforation there is either a thick, cheesy scale, or a tough, sticky crust. There is little discharge at first, but this increases in quantity as the cholesteatoma increases in size and gets swollen by injections of water, or the entrance of any fluid.

There may now occur attacks of vertigo and other nervous phenomena, such as agoraphobia. The head may feel constricted, and dull pains may set in in the corresponding temple, or in the entire head, followed sometimes by tenderness and swelling behind the auricle, and prolapse of the posterior wall of the auditory canal. The pain now becomes very severe, especially at night. At this point the cholesteatoma may break its way outward, either through a perforation through the mastoid or one in the posterior wall of the auditory canal. In some cases the entire membrana and the malleus may be carried away by the escaping purulent mass. Serious results are caused by those cases of cholesteatoma which make their way into the cranial cavity through a defect in the bone, and set up a subdural abscess. Diffuse meningitis, abscesses in cerebrum or cerebellum, or sinus-thrombosis, and pyæmia, now bring about a fatal result.

Neither inspection of the ear nor the anamnesis is always sufficient to establish the diagnosis. This is not made with certainty until laminæ of cholesteatoma are found. Injections with the tympanic syringe into the attic space, through the perforation in the membrana flaccida, will bring away characteristic pieces of cholesteatoma.

Treatment consists in removal of the cholesteatomatous mass and thorough cleansing and healing of the diseased cavities occupied by the morbid collection. Ordinary syringing of the auditory canal is not strong enough to fulfil these two indications. It is necessary to throw a strong stream directly into the diseased cavity by means of the tympanic syringe. The fluid thus injected should consist of a mixture of equal parts of saturated solution of boric acid and a 5 per cent. solution of carbolic acid. [The author seems unaware of

the solvent properties of hydrogen dioxide, widely used in this country for just such purposes.—REV.] Polypoid growths must be removed. The cholesteatomatous cavity should be dried after syringing, and powdered boric acid insufflated. Considering the affection as a dermatitis, a theory adopted by many, Siebenmann has insufflated a mixture of boric acid and salicylic acid, a treatment employed successfully by Scheibe, of Munich. Syringing should be done daily at first, then less frequently. If the perforation in the membrana flaccida is too small, and the cavity too large and sinuous, excision of the membrana and extraction of the malleus and incus may be required in order to facilitate the thorough medication of the diseased cavity. If this treatment does not bring about a cure, the more radical operation of perforation of the mastoid and exposure of the antrum may be required.

OBSTETRICS.

UNDER THE CHARGE OF

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HÆMOGLOBIN IN THE BLOOD OF THE NEWBORN CHILD.

In an Inaugural Dissertation (Basel, 1892) CATTANEO publishes the following results of investigations upon this subject: He finds that at the moment of delivery the blood of the average woman contains 93.8 per cent. of hæmoglobin. In comparison, the foetal blood has a much greater amount, which may be relatively stated to be 120.2 per cent. No differences can be distinguished between arterial and venous blood in the umbilical cord in the amount of hæmoglobin contained. Anæmia on the part of the mother does not seem to influence the amount of hæmoglobin in the foetal blood, nor in the blood of the child immediately after birth. In thirty-six or forty-eight hours after birth the blood of the newborn contained its greatest amount of hæmoglobin, the quantity diminishing during the following days. When the cord is tied late after birth the child's blood contains more hæmoglobin than when it is quickly ligated. A small placenta increases the amount of hæmoglobin in the foetal blood, and a large placenta makes the amount relatively smaller.

PRACTICAL SUGGESTIONS FROM RECENT EXPERIENCES IN CÆSAREAN SECTION.

In the *Transactions of the Obstetrical Society of London*, 1892, vol. xxxiv., are found descriptions of several cases of Cæsarean section in which the fol-

lowing points of practical interest are brought out: COLLINGWORTH, in operating upon a primipara, opened the uterus *in situ*; elastic ligature was dispensed with, hemorrhage being prevented by digital pressure and keeping the edges of the wound together. The child was not asphyxiated in the slightest degree, and the contraction and retraction of the uterus were most satisfactory. The method of suturing was by deep and half-deep silk sutures: the deep sutures avoided the decidua, and between each a half-deep suture was inserted. The uterus was emptied of clots, but no antiseptic douching or swabbing was employed. Each Fallopian tube was ligated. During the recovery the lochial discharge was almost nothing.

SHAW operated on a rachitic primipara, suturing the uterus with catgut and tying the tubes with silkworm-gut. A rubber ligature was used during the operation, and the child was born in a condition of deep asphyxia. The uterine cavity was douched with a solution of perchloride of iron, dried, and dusted with iodoform. The patient had septic infection, which yielded to several intra-uterine irrigations. Shreds of membrane were washed away from the uterus. In commenting upon his case, Shaw recognizes what he styles certain mistakes: first, as labor had not begun and the os was not dilated, it would have been better to have performed the Porro operation, as the undilated os did not admit of free drainage; second, too much ergot was given, fearing hemorrhage. [The reporter would add to this the use of iron upon the endometrium. It is no wonder that septic infection followed the unnecessary application of such a styptic.]

NAPIER performed the Cæsarean operation upon a secundipara whose first labor had been terminated by craniotomy; he operated before labor, tying the Fallopian tubes with two silk ligatures and dividing the tubes between the ligatures. The uterus was flabby, and was sutured with silk. During her convalescence the patient had a severe attack of pleuro-pneumonia, but recovered perfectly. Mother and child left the hospital well. There was no hemorrhage at the time of operation until the uterus had been sutured and the abdominal wall had been closed; then free hemorrhage occurred, for which a hot intra-uterine douche of boric acid was given. A piece of membrane was washed out of the uterus by the douche, and hemorrhage ceased. The elastic ligature was used, and was drawn tightly about the cervix. To this fact the operator ascribes in great part the occurrence of hemorrhage. In the discussion, CAMERON based his remarks upon his list of fifteen cases, with two deaths. He prefers to operate when labor has begun and the os is slightly dilated. The uterus should be brought to lie in the median line, and a flat pessary placed upon the anterior wall around the point of incision. When the membranes are reached, the wound is enlarged with a blunt-pointed bistoury, and the pessary is removed. The uterus should not be everted until it is emptied. No ligature is required around the cervix. The uterus is everted after the removal of the placenta and membranes. The uterus is sutured with silk, is enveloped in a large, flat, warm sponge and firmly compressed, which immediately causes contraction. Superficial catgut sutures should be inserted if the edges of the peritoneum bleed. The uterine cavity should not be washed out or medicated in any way; the less the parts are meddled with, the better. It is well to ligate the Fallopian tubes if sterility is desired. The abdominal wound is closed with silk, and intermediate

silkworm-gut sutures are employed; these may be left for some days after the silk sutures are removed. The diet for the first three days should be sips of warm water and milk in increasing quantities; morphia in half-grain doses by suppository is used when necessary. The bowels are moved on the fourth day, after which the patient is allowed soup and broth. BLAND SUTTON had recently performed the Cæsarean section successfully in a small room in a private house under adverse circumstances; the fœtus was dead, and its head showed the effects of extreme pressure. Sutton tied each Fallopian tube near the uterus by a single silk ligature; tying in two places and dividing between the ligatures is unnecessary.

ECTOPIC PREGNANCY.

MARTIN, of Berlin, at the recent International Congress at Brussels, gave the results of his observation in 56 cases of ectopic gestation. So far as etiology is concerned, our knowledge scarcely extends beyond a mechanical hindrance to the passage of the ovum from the ovary to the uterus. Ovarian pregnancy has been observed, although very rarely. The most frequent location of the ovum is in the ampulla of the tube. In his cases, such was the situation in 49; in 34 upon the right side, in 22 upon the left. So soon as the ovum lodges in the tube, the decidua begins an irregular development, never entirely enclosing the ovum. The serotina is less developed than in uterine pregnancy; the fœtal portion of the placenta does not differ from that of normal pregnancy. The muscular layer of the tube does not increase progressively, but after a certain point undergoes excessive atrophy. More or less irritation of the peritoneum is present. The uninvolved portion of the tube undergoes no change except that the fimbrian extremity is closed. As the ovum increases in size, the tube becomes bent and adherent. In 11 of his cases the ovum was attached on the side of the tube next the broad ligament. The uterus increases in volume during ectopic gestation and is in a condition of general hypertrophy. The uterine decidua also develops, but to a less extent than in normal pregnancy. It often undergoes a retrograde process while the ectopic gestation continues its course. Most cases of ectopic pregnancy terminated in tubal abortion within the first three months. Martin's table shows that 15 terminated in the first month, 13 in the second, 11 in the third, 7 in the fourth, the remainder occurring before the ninth month. The fœtus attained viability but once in his cases. The interruption of ectopic pregnancy usually occurs from failure in the physiological conditions existing between the ovum and the cavity containing it. The pain which occurs at tubal abortion is caused by the passage of blood through the tube. The newly developed bloodvessels burst, while the strongly developed muscular layer of the tube is not ruptured. Thus many cases result in spontaneous recovery. Convalescence, however, is prolonged, and there is danger of death from shock, hemorrhage, and the development of septic infection. Localized pelvic peritonitis is also common. Martin quotes Schauta's collection of 241 cases in which the ovum was not removed by operation. Of these, 128 ruptured into the abdominal cavity with bleeding; in 22, a hæmatocele formed with peritonitis. In 34, rupture occurred into the intestine; in 9, into the bladder; in 5, the abdominal wall was per-

forated. In 4, the vagina was entered; in 6, the ovum escaped through the uterus; in 4 cases it became incarcerated with ileus; and in 9 cases litho-pædion was formed without especial annoyance to the patient. He had personally observed 5 cases in which rupture occurred, which were not treated by operation; all of them perished. The symptoms of ectopic gestation embrace some of those of normal pregnancy; early in the case, symptoms of peritoneal irritation predominate. Menstruation is disordered, hemorrhage finally ensues; during the first three months, a probable diagnosis only can be made. A positive diagnosis of rupture is made by pain and collapse with profound anæmia. The child is usually not considered in the question of prognosis or operation; the prognosis for the mother, when the cases proceeded without operative interference, he found to be 68.8 per cent. mortality and 31.2 per cent. recovery. In 585 cases in which operation was performed, 76.6 per cent. recovered and 23 per cent. perished. Martin had enlarged Schauta's table and found that in 265 cases treated expectantly, 36.9 per cent. recovered, and in 515 cases operated upon, 76.7 per cent. recovered. His belief is that operation is invariably indicated. The morphine treatment of Winckel is not indorsed, nor the treatment by electricity; the ovum should be completely removed; when the fetal sac cannot be completely extirpated, it may be stitched to the abdominal wall or punctured and drained through the vagina.

TUBAL GESTATION IN BOTH TUBES; OPERATION; RECOVERY.

In the *British Medical Journal*, 1892, No. 1657, a remarkable case of double tubal gestation is reported by WALTER. The patient was a multipara in early pregnancy; she had suffered from abdominal pain, but was not sure of her condition. On examination the uterus was normal in size and position, its mobility slightly impaired. Close to the uterus, at its left, was a mass the size of an orange, which could not be clearly outlined. Although operation was suggested at once, circumstances prevented until five months afterward. The patient meantime suffered from cough and bronchitis, but menstruated regularly a portion of the time. On a second examination the swelling in the left side seemed partly cystic and as large as a hen's egg. Operation was again delayed on account of the condition of the patient's lungs. When readmitted, it was found that the patient had not menstruated for seven weeks, during which time she suffered from nausea. When another examination was made, in addition to the swelling at the left of the uterus, one was detected upon the right; the uterus and both swellings were matted together. In preparing for the operation the patient was given an aperient; her bowels moved several times, after which she was seized with sudden pain in the abdomen, vomiting, and syncope. The patient rallied, and was operated upon the following morning. When the abdomen was opened, clotted blood was found in its cavity. A tense cystic swelling, resembling an orange in size, was found in each broad ligament. The adhesions were separated, and the right tube and ovary first removed. On the left side the ovary was small and flattened, and so adherent low down that it was allowed to remain. The swelling in the tube had become almost enucleated and was readily removed. The abdomen was irrigated with hot water, which brought away a number

of large clots. A glass drainage-tube was inserted and dry dressings applied. For the first twenty-four hours after operation the fluid removed from the tube was almost pure blood, four and a half ounces in quantity. During the second twenty-four hours the fluid measured ten drachms, and consisted of serum. On the third day the tube was removed. The patient suffered but little shock, her pulse went over 100 but three times, and her temperature varied between normal and 100.8°. The day after operation menstruation began and lasted three days, after which nausea ceased. The patient made a good recovery, and subsequently reported for examination. She was found to have gained flesh, and to have menstruated regularly with less pain. The specimens were sent to Mr. Bland Sutton, who reported that in the left tube an apoplectic ovum or tubal mole was found; the amniotic cavity contained an embryo six cm. in length. In the right tube the abdominal end was completely occluded; it also contained a tubal mole, the amniotic cavity persisting, but no embryo was found. A portion of the wall of the tube, with an adjacent piece of the mole, was hardened and examined by the microscope. Chorionic villi were found in clusters, proving tubal pregnancy; the pregnancy in the left tube was much more advanced than in the right. It was impossible to state whether impregnation occurred in each tube at about the same time, or whether the ovum in the right tube became apoplectic and ceased to grow. Mr. Sutton considers this the first proven case of double ectopic gestation.

DR. SAVAGE has reported (*British Medical Journal*, 1892, vol. i. p. 556) a case of tubal pregnancy occurring on each side. The occurrence, however, was not absolutely demonstrated to have taken place. MACKENRODT reports (*Zeitschrift für Geburtshilfe und Gynäkologie*, Band xxiii., Heft 1) a case of bilateral tubal pregnancy in a woman aged thirty-two years; she was seized with symptoms indicating rupture of a gravid tube, but declined operation. More than a year afterward the symptoms recurred; operation was then performed, and a gestation sac as large as a goose-egg removed from the left side. On the right side a sac matted with intestines was found, containing foetal bones. The patient made a good recovery.

FURTHER LITERATURE ON ECTOPIC GESTATION.

SPACE does not permit extended abstracts of recent papers upon this subject, but the following papers describe cases of interest: In the *St. Petersburger medicinische Wochenschrift*, No. 33; 1892, VON STRAUCH reports four cases of ectopic gestation upon which he operated; in one instance he found a lithopædion adherent to the mesentery. His cases illustrate the fact that operative procedures are the only means of value in dealing with this condition. The details of his cases will be found of interest to those who operate in abdominal surgery.

In the *Deutsche medicinische Wochenschrift*, No. 37, 1892, SCHNEIDER reports a case of ectopic gestation operated upon in the seventh month with the delivery of a living child. Nine months afterward the patient was anesthetized with chloroform for operation upon a ventral hernia; she perished before the beginning of the operation from the anæsthetic. He also reports two cases of tubal gestation in the left tube, in which the embryo and tube

the anterior abdominal wall. He found that the angle of inclination of the pelvis was 24° , instead of about 51° , which was regarded by Braun as about normal. In consequence the abdominal pressure was directed in such a line as to favor descent of the pelvic contents. Patients with such a slight inclination of the pelvis are peculiarly liable to prolapse of the uterus and vagina, even when the pelvic floor is perfect. This is a fact to be carefully considered before performing ventro-fixation for the cure of this condition, and may be a key to the success obtained by Thüre Brandt. It may also explain why complete laceration of the perineum is sometimes unaccompanied by displacement of the uterus.

[It would appear as if the writer assigns too little importance to the integrity of the pelvic floor (not the perineal body alone), which is certainly sufficient to counterbalance the effect of misdirected abdominal pressure. If that important support of the uterus is removed, of course ventro-fixation could not be expected to supply its place. The writer seems to present a strong argument against resort to this operation for the cure of prolapsus except under the most favorable conditions.—H. C. C.]

CELIOTOMY BY THE TRANSVERSE INCISION.

BARDENHEUER (*Ibid.*) reports sixty-three cases in which he opened the abdomen by a transverse incision immediately above the symphysis, the patient being placed in Trendelenburg's posture. He prefers this method in cases of deep-seated pelvic neoplasms and purulent foci (especially where there are many adhesions), which are rendered directly accessible through the transverse incision. If the wound is carefully closed there is no danger of ventral hernia. He sutures peritoneum, fascia, and muscle separately with catgut, previously including all the layers with silver-wire sutures. In performing ovariectomy the stump is attached to the opposite angle of the wound. In fifty-eight sections in which the peritoneal cavity was opened (including nine abdominal hysterectomies and seven supra-vaginal amputations) the mortality was eight and one-half per cent.

CASTRATION FOR THE RELIEF OF MENORRHAGIA DUE TO UTERINE FIBROIDS.

CHARRIER and CAZENOVE (*Gazette Médicale de Paris*, 1892, No. 37) detail the histories of successful cases in Pozzi's clinic, showing the value of the operation in the case of fibroids too small to justify a radical operation, yet associated with persistent and profuse menorrhagia. In their deductions the authors compare the two operations of castration and hysterectomy as to gravity, showing that the former accomplishes the desired result with far less risk to the patient.

[We venture to call attention in this connection to an error into which gynecologists may be led by reason of the remarkable success which has attended the modern operation of abdominal hysterectomy for uterine fibroids—that of losing sight of the fact that an operation is not always justified by the easy recovery of the patient. While small fibro-myomata, if impacted in the pelvis, do undoubtedly sometimes give rise to serious pressure-symptoms which would not be relieved by either electricity or

castration, the too enthusiastic operator must not forget that there is a large proportion of cases in which complete extirpation of the uterus is not justified even by the presence of a tumor of considerable size. The leaders in the brilliant records of abdominal surgery must always remember that there are a host of lesser lights who are ambitious to emulate them, and who need to be constantly reminded of the maxim: *Medio tutissimus ibis*. Certainly the experience of such an eminent surgeon as Lawson Tait should prevent us from entirely abandoning castration for abdominal hysterectomy without serious consideration.—H. C. C.]

GONORRHOEAL PERITONITIS IN THE FEMALE.

AN interesting editorial on this subject (based upon a recent thesis of CHARRIER'S) in the *Gazette hebdomadaire de Médecine et de Chirurgie*, 1892, No. 39), gives the following conclusions: The continuity of the external and internal genital tract in the female renders her peculiarly liable to ascending specific infection. Two forms of peritonitis are peculiar to the sex—puerperal (identical with which is the septic form following impure traumatism) and specific, or gonorrhœal, characterized by a localized plastic exudate; the streptococcus pyogenes is peculiar to the former septic variety, while the gonococci are characteristic of specific infection. The latter variety of peritonitis may be characterized as "remittent," its exacerbations being coincident with menstruation and sexual excesses. It was formerly described as pelvic peritonitis due to menstrual congestion. In addition to the puerperal, or streptococcus, and the venereal, or gonococcus, varieties there is an intermediate form (*puerpéro-gonorrhéique*), which combines the symptoms and lesions of both. It is extremely important to recognize the presence of perimetro-salpingitis during the course of gonorrhœa; in fact, the liability to such a complication should lead us to treat vigorously the slightest manifestations of incipient infection. Gonorrhœal endometritis, above all the latent form located in the cervix, should receive especial attention; injections of tincture of iodine and of a one per cent. solution of permanganate of potassium are particularly efficacious.

ASCITES IN THE FEMALE.

OLIVER (*Lancet*, September 24, 1892) reports several cases illustrating the fact that free fluid accumulates in the peritoneal cavity of the female under various conditions not present in the male (chronic peritonitis, papilloma, ovarian cystoma, etc.). In a case of general fibroid thickening of the peritoneum he infers the presence of vasomotor disturbances as an important etiological factor. He calls attention to the fact that the fluid accumulates at an early stage of malignant disease of the omentum before the peritoneum has become generally affected, the impoverishment of the blood having much to do with the exudation. It is important to note in this connection that cancerous ascites is progressive, whereas the exudation accompanying benignant growths may cease for a time, or even be diminished, in consequence both of lessened transudation and actual absorption.

Dropsy of the peritoneum in tuberculosis the writer explains by reference

to the alteration in the blood, together with the disturbance in the relationship of the arterial and venous pressures. Hence the occasional disappearance of the fluid after treatment and the fact of its not reaccumulating after abdominal section, even in cases in which drainage is not employed—a result not to be expected in cancerous ascites where the dyscrasia is progressive. In papilloma of the peritoneum the transudation seems to be due to the great vascularity of the papillomatous masses.

In cases of ascites accompanying ovarian cystoma, even when the latter is neither papillomatous nor cancerous, the cyst-wall will frequently be found to be in a state of fatty degeneration. The writer has noted the presence of dropsy of the peritoneum in connection with uterine fibro-miomata which have undergone degenerative changes, but is unable to explain the phenomenon.

A NEW METHOD OF SHORTENING THE ROUND LIGAMENTS.

CHALOT (*La Semaine Médicale*, 1892, No. 47) regards the following method as simpler and more certain than that practised by Alexander: 1. Open almost the entire inguinal canal, thus completely exposing the ligament, no matter how fat the patient may be. 2. Dissect out the ligament as high as the internal ring, if necessary following it into the peritoneal cavity. 3. Instead of having the uterus replaced, and held in place by an assistant, it is drawn into a position of anteversion by simultaneous traction on both ligaments. 4. Each ligament is then sutured to the edges of the canal throughout its entire length. 5. No pessary is used after the operation. Six successful cases are reported in which the uterus remained in position.

[The writer must have encountered stronger ligaments than most operators in order to make such traction upon them without rupturing. We do not see any striking advantage to be gained by this modification of the usual method of procedure.—H. C. C.]

PÆDIATRICS.

UNDER THE CHARGE OF

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OF PHILADELPHIA;

ASSISTED BY

THOMPSON S. WESTCOTT, M.D.,

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A CLINICAL AND BACTERIOLOGICAL STUDY OF DIPHTHERIA.

LOUIS MARTIN (*Annales de l'Institut Pasteur*, 1892, No. 5, p. 335) has recently published a valuable clinical and bacteriological study of 200 cases of real or suspected diphtheria admitted, under his observation, to the Pavilion of Diphtheria in the Hôpital des Enfants Malades, Paris. For purposes of

diagnosis two methods of examination are available—either by direct examination of particles of membrane or mucus from the throat, by the method of Roux and Yersin, or by culture-growths upon coagulated serum, a medium which lends itself most readily to the bacillus of diphtheria. The second method is considered preferable, and more readily managed than the direct examination, which requires much care and considerable technical skill. When the colonies of the Klebs bacillus are in great majority the case may be considered as a pure diphtheria; but, if with this there are numerous colonies of other species, most commonly cocci and streptococci, the aspect of the case is somewhat modified in its course and prognosis. Beside the usual typical long bacillus which is described by all observers, the author has noted little short rods disposed parallel to one another, and appearing somewhat broader than the ordinary form, because of their shorter length; and also an intermediate form, somewhat longer, and disposed in the same manner. The short bacillus, which very closely resembles in its properties the pseudo-bacillus described by Löffler, the author regards as very benign; the intermediate form as slightly toxic, while the long bacillus, he states, is the most virulent. When death occurs in a case showing only the short bacillus, there is then an association with streptococci, or the disease has followed an attack of measles.

Upon such an examination alone should the diagnosis depend. Neither the seat, appearance, nor consistence of the false membrane is a sure clinical sign; nor is glandular involvement a test of pure diphtheritic disease, for in many of the forms of mixed infection the swelling of the cervical glands is in part due to the other organism. Albuminuria is often of late occurrence in the true disease, and is not necessarily absent in non-diphtheritic anginas.

In point of prognosis, Martin attaches great importance to the temperature curve. At the beginning of an attack of diphtheria he has found the temperature to oscillate usually between $100\frac{2}{3}^{\circ}$ and $102\frac{1}{3}^{\circ}$. If the temperature remains at this level for four to six days and then undergoes descending oscillations, or commences to descend after attaining or passing the higher record, the prognosis is favorable. On the other hand, if the temperature remains between $102\frac{1}{3}^{\circ}$ and 104° for two or three days, prognosis is serious but not fatal; while if it remains more than three days without descending oscillations, prognosis is most grave; and a temperature of 104° with ascending oscillations is almost always fatal. Beside its value in prognosis the temperature curve affords a significant indication of the invasion of new territory, such as extension to the larynx, or to the bronchi or lung, accidents which are marked by elevations of temperature.

In several of his autopsies the bacillus has been found in profusion in the lung, in foci of broncho-pneumonia, while no membrane was seen in the throat, and very little in the trachea—a fact which leads M. Martin to believe that in these cases the lung may be the initial point of invasion, and that the trachea and larynx are only secondarily involved.

Coming now to an analysis of his cases, we find that out of the 200 children brought to the hospital with suspected diphtheria, 43 had non-diphtheritic angina and 19 non-diphtheritic croup. Of these 43 cases of angina, 33 were submitted to careful study, and 25 were found to exhibit only cocci, and the remaining 8 only streptococci. Of these 25, 20 were due to the coccus de-

scribed by Roux and Yersin. They closely simulated true diphtheria, except, perhaps, that the membrane was a little more white and less elastic, but they were cured rapidly, and left no trace of intoxication. The 8 cases due to streptococci showed a grayish-white exudate, sometimes even reddish in appearance; fever was high and sudden, prostration marked, and the prognosis grave, though death was rare.

Of 69 cases of diphtheritic angina without croup, 52 were due solely to the Klebs-Löffler bacillus (24 recovering), while 17 were found mixed with streptococci and the cocci already mentioned. Those cases showing streptococci were extremely grave, 8 out of 10 dying; but the cases with cocci followed a benign course, with 6 recoveries out of 7.

Of 54 cases of croup, with false membrane on the fauces, 7 were non-diphtheritic, 13 were mixed infections, and the remaining 34 were diphtheritic. As in the anginose cases, the virulence of the mixed cases depended upon the associated microbe; 4 cases showing the streptococcus all died; while 8 out of 9 showing associated cocci recovered. Of the 34 diphtheritic cases, 18 died, a mortality very close to that observed in the pure diphtheritic anginas.

Finally, in the group of 34 cases of croup without membrane in the fauces, 21 were found to be diphtheritic; 7 of these were readily diagnosed by clinical examination, 5 were tracheotomized, and 6 cured. Among the other 14 cases only 3 recovered.

LYMPHANGITIS OF THE BREAST AND ITS DANGER TO THE NURSING.

MAYGRIER and CHAILLOU (*Journal de Médecine de Paris*, 1892, No. 29, p. 350) record an instructive case of infection in a newborn baby, originating in a lymphangitis of one of the mother's breasts. The mother was a primipara, and was delivered at term of a healthy girl, the puerperium proceeding without unusual incident for eight days. On the ninth day she manifested a slight lymphangitis of the right breast, with engorgement of three or four lobules of the gland, and a little rise of temperature lasting two days. Complete resolution took place within ten days. During this time the child had nursed from both breasts, but had at once begun to lose weight. Six days after the appearance of the inflammation the child was noticed to be nursing poorly, and was wakeful and peevish during the night, and next day had a temperature of $101\frac{1}{2}^{\circ}$, with greenish stools. On the following day frequent convulsions occurred, at first exactly limited to the left arm and left side of the face and neck, and then becoming generalized. Death occurred the next day, being preceded by renewed convulsions, coma, paralysis of the lower extremities, with partial paralysis of the left arm. The autopsy showed suppurative phlebitis of the higher branches of the superior mesenteric vein, of the portal vein, and of its branches in the liver. The upper part of the spinal canal was filled with pus, which extended upward and completely surrounded the medulla and cerebellum. The right hemisphere of the brain was almost completely covered with a layer of pus, and showed a small abscess in the ascending frontal convolution, while, on the left, the fissure of Sylvius and the frontal lobe were covered with a purulent effusion. The entire base of the brain was bathed in pus.

After considering the possible sources of infection, the authors conclude that microbes must have entered the child's system through the gastro-intestinal tract, and that the source of infection must have been the inflamed lymphatics of the maternal breast. Bouchut, in 1862, remarked that in cases of abscess of the breast, if pus became mixed with the milk, the child had vomiting, diarrhœa, and sometimes fatal erysipelas; and Budin has noted similar cases.

The unfortunate sequel of this case gives rational justification to the practice of many accoucheurs, Tarnier in particular, who forbid the nursing of children during the existence of the slightest lymphangitis of the mother's breast.

THE RESORPTIVE POWER OF THE STOMACH IN YOUNG CHILDREN.

PFANNENSTIEL (*Nordiskt Medicinskt Arkiv*, 1892, Bd. ii., Hef 3) reviews the work of previous observers in estimating the resorptive power of the stomach by the iodide of potassium test of Penzoldt-Faber. All these investigations have been made in the adult, and show that after ingestion into the empty stomach of a healthy man, iodide can be detected in the saliva or urine within seven to fifteen minutes. In certain diseases of the stomach, and when the viscus contains relatively large quantities of food, the period of absorption is considerably delayed. This is most pronounced (as late as four hours) in case of cancer of the stomach and of dilatation of this organ; while it is not so considerable or so constant in chronic gastritis.

By a slight modification of the method of Penzoldt-Faber, the author has turned his own investigations to very young children, ranging in age from one month to one year. Two and a half to three hours after an ordinary meal—the breast, or a mixture of sterilized milk—a solution of about three grains of potassium iodide was administered, and then a regular catheterization of the bladder was carried out every five or ten minutes. In healthy children the drug was detected at the end of fifteen to twenty minutes, and sometimes not till twenty-five minutes, a result which shows that with young children the absorption of iodide of potassium is at least five minutes slower than with adults.

A further study upon fifty children suffering from dyspeptic troubles, more or less grave, showed that the iodide could not be detected until from twenty-five to forty-five minutes after its ingestion. The author therefore concludes that the absorptive power of the mucous membrane of the stomach of young children is a little more feeble than in adults, and that catarrhal alterations also tend to diminish this power.

PELIOSIS RHEUMATICA.

HERTZKA (*Archiv f. Kinderheilkunde*, 1892, Bd. xiv. p. 199) reports a case which reproduces almost exactly the clinical picture of this affection drawn originally by Schönlein.

The patient was a boy of eleven years. The illness began with the symptoms of a grave febrile infection: temperature of $105\frac{1}{2}^{\circ}$, vomiting, headache, delirium, and prostration. The grave cerebral phenomena persisted for six days, and the cephalalgia for three weeks, symptoms which depended doubt-

less upon intra-meningeal transudations analogous to the exudates in the serous membranes of the joints.

The temperature during the first two days oscillated between 104° and $105\frac{4}{5}^{\circ}$, then it fell quite suddenly to remain for forty-eight hours between 99° and $101\frac{3}{10}^{\circ}$. At this time the petechial eruption had ceased, but the articulations now became affected, one after the other, during a period of six to eight days; and here again the temperature for four days ranged between 102° and $104\frac{1}{5}^{\circ}$. When the articular trouble subsided the temperature fell again to 99° and $101\frac{3}{10}^{\circ}$. But at the end of two days occurred another access of the joint affection which lasted eleven days, and during this time the fever returned in a distinctly remittent type, 100° and $100\frac{4}{5}^{\circ}$ in the morning, and $102\frac{1}{5}^{\circ}$ and 104° in the evening. When the articular inflammation had subsided the temperature became normal.

The eruption of petechiæ conformed to the description of Schönlein. Contrary to what is observed in purpura, the trunk was spared, and the eruption was seated upon the members, the face, the conjunctiva, and the uvula. The spots appeared on the second day, and the eruption had disappeared on the fifth day after the beginning of the affection. About the articulations the spots became confluent, contrary to the description of Schönlein, who never observed confluence in this disease. The articular localizations, which began on the fourth day, followed the classic picture of acute articular rheumatism, the joints affected being the knees, the ankles, the wrists, and the fingers.

The disease, therefore, presented itself in the form of an acute articular rheumatism complicated, for reasons which are unknown, by purpura. It is important to note that the salicylates, as well as other antipyretics, had no action upon either the fever or the pain.

HYPERSECRETION OF SALIVA AFTER MUMPS.

SIMON and PRAUTOIS (*Revue de Clinique et de Thérapeutique*, April 15, 1892) have observed a case of hypersecretion of saliva consecutive to mumps; 200 to 250 grammes of saliva were secreted in twenty-four hours. Judging by the increase of fixed constituents, especially the chlorides, these observers were of the opinion that it was due not to a simple glandular hyperæmia, but to an over-activity of the special secretory nerves of the gland. The favorable action of sulphate of atropine was another proof of this theory. Such salivation, they say, may become by its abundance a real complication, and may continue for several months after cure of the disease.

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INDEX.

- A**BDOMEN, gunshot wounds of, 93, 607
 Abdominal and pelvic emergencies causing death, 244
 Abdominal massage, 83
 Abdominal pregnancy, 496
 Abdominal wall, desmoids of, 95
 Abortion for pregnancy complicated with aortic disease, 241
 Abortion, tubal, 112
 Abscess of temporal lobe, 104
 Abscess, tubercular retro-pharyngeal, 628
 Accessory thyroid gland, 377
 Actæa racemosa in dysmenorrhœa and ovarian irritation, 211
 Actinomycosis of foot, 344
 Adenoid vegetations of rhino-pharynx, 235
 Adenoma of larynx, 622
 Adiposis dolorosa, 531
 Alcohol, action of, in nervous system, 643
 Alopecia areata, treatment of, 230, 469
 American Otological Society, 491
 Ammonia as an anthelmintic, 339
 Amputation, high, in senile gangrene, 562
 Anæmia, acute, saline injections in, 499
 Anæsthesia by cocaine, 213
 Aneurism of ascending aorta, 224
 Angeio-neurotic œdema, 654
 Ankle-joint, compound dislocations of, 219
 Ankle, Pott's fracture at, 611
 Antiseptic wound treatment, 606
 Aortic aneurism, treatment of, 422
 Aortic disease, use of digitalis in, 86
 Aphthous stomatitis, etiology of, 123
 Appendicitis, 358, 627
 Arthritic muscular atrophy, 478
 Asaprol, 465
 Ascites in its relation to gynecology, 617
 Ascites in female, 741
 Aseptic and septic surgical cases, 604
 Asthma, 363, 464
 Bacteriological researches, 1
 Bacteriological study of drinking-water, 167
 Bacteriology of eclampsia, 239
 Basedow's disease, treatment of, 209
 Bassorin paste in skin disease, 229
 Bevan, unusual case of tuberculosis, 565
 Blood, specific gravity of, 475
 Blood, subcutaneous injection of, 336
 Brain, otitic abscesses of, 488
 Breast, lymphangitis of, 744
 Bright's disease, treatment of, 712
 Broncho-pneumonia, infectious, 716
 CÆSAREAN section with oöphorectomy for osteomalacia, 613
 Cæsarean section, successful, 111, 370
 Cæsarean section, recent experiences in, 733
 Calcium salts for promoting heat, 337
 Cancer, removal of, 115
 Canfield, inhalation of dust and pulmonary disease, 686
 Carcinoma and endothelioma of ovary, 617
 Carcinoma and fibro-myoma of uterus, 497
 Carcinoma of larynx, 365, 623
 Carcinoma of rectum, operation for, 610
 Carcinoma of uterine body, 115
 Carcinoma, inoperable, treatment of, 500
 Carcinoma uteri, treatment of, 117
 Carcinoma uteri with fibro-myoma, association of, 116
 Carica papaya in gastro-intestinal disorders, 584
 Carter, metal-turners' paralysis, 61
 Castration for relief of menorrhagia, 740
 Catherization of biliary ducts, 98
 Cerebellum, serous cysts in, 151
 Cerebral development, pathology of arrested, 595
 Cerebral disease after simple operation in nose, 623
 Cerebral syphilis, 470
 Cervix, dissection of, 245
- B**ACILLUS of measles, 376
 Bacteria, development of, 723

- Chancre of cervix uteri mistaken for epithelioma, 118
 Cheyne-Stokes nystagmus, 720
 Childhood, cirrhosis of liver in, 500
 Children, appendicitis in, 627
 Children, hepatic cirrhosis in, 597
 Chloroform, danger of administering, in presence of naked flame, 590
 Chloroform, rules for administration of, 591
 Chloroform, toxic action of impure, 223
 Cholecystotomy, 353, 482
 Cholera, artificial immunity to, 596, 722
 Cholera in Hamburg, 593
 Cholera morbus, fatal case of, 600
 Cholera, treatment of, 581, 583, 712
 Cholera, sterilization of water during epidemics of, 718
 Cholesteatoma of middle ear, 732
 Chorea and rheumatism, 251
 Chorea in negro, 626
 Chorea, treatment of, 214
 Chronic purulent otitis media, 106
 Chronic suppurative affections of middle ear, 490
 Cicatrices of neck, excision of strumous, 248
 Cirrhosis of liver in childhood, 500
 Club-hand of congenital origin, 486
 Clutton, chronic intussusception of cæcum, 280
 Cochlea, function of, 106
 Codeine sulphate, 209
 Cœliotomy by transverse incision, 740
 Cœliotomy, conservative, 620
 Collins, angio-neurotic œdema, 654
 Colotomy, left inguinal, 355
 Combined tuberculosis and gonorrhœal endometritis and salpingitis, 499
 Constitutional origin of local disease, 362
 Coplin, unusual case of tuberculosis, 565
 Corpus uteri, carcinoma of, 738
 Creasote and its elements, 83
 Cyst of middle turbinated bone, 361
 Cysts of hymen, 616
 Cysts of pancreas, 617
 Cystitis, subacute, treatment of, 94, 464
 Cystotomy, supra-pubic, 724
- DABNEY**, contribution to the study of hepatic abscess, 125
 Davis, retro-peritoneal tuberculosis, 695
 Deafness, treatment of, 109
 Delirium tremens, treatment of, 589
 Dercum, adiposis dolorosa, 521
 Dermatitis hæmostatica, 229
 Dermatitis herpetiformis, 553
 Dermatitis tuberosa from iodide of potassium, 227
 Dermatol, 590
 Dermoid cysts, position of, with relation to uterus, 500
 Desmoids of abdominal wall, 95
 Diabetes and leukæmia, 477
 Diabetes mellitus, vegetable albumin in dietetic treatment of, 589
 Diabetes, treatment of, 85
 Digestive ferment in *anagallis arvensis*, 81
 Digitalin, action of, upon pulmonary circulation, 462
 Digitalis, therapeutic action of, 335
 Diller, tumor of the pons in which tapping of the lateral ventricles was done for the relief of intra-cranial pressure, 509
 Diphtheria, bacteriological study of, 742
 Diphtheria, chronic, of nose, 236
 Diphtheria, treatment of, 84, 624, 626, 713
 Dissection of cervix, 245
 Disorders of teeth during pregnancy, 371
 Diuretin, therapeutic action of, 338
 Dropsy, renal, 87
 Drug habituation, 340
 Dühring, morphaea with maculae atrophicæ, 551
 Dysentery, treatment of rectal, 157, 712
 Dyspepsia, chronic, Günzberg's test in, 716
 Dyspnœa, treatment of, 588, 717
- ECHINOCOCCUS** cyst of liver obliterated by laparotomy and drainage, 485
 Eclampsia, treatment of, 616
 Ectopic gestation, 495, 735, 737
 Eczema, infantile, 374
 Edebohls, combined gynecological operations, 262
 Electrical energy, treatment by, 713
 Electrical resistance of urine, 345
 Elliott, dermatitis herpetiformis originating from causes connected with the uterine organs, 553
 Empyema, resection of rib for cure of, 625
 Endometrial microorganisms, 438
 Endometritis in acute general diseases, 119
 Endothelioma of ovary, 119
 Enteric fever complicated by suppurative epididymitis, 92
 Enteric fever, treatment of, 81
 Epilation, value of, 222
 Epilepsy, cortical, 691

Epilepsy cured by injection of Pasteur's antirabic liquid, 589
 Epilepsy, treatment of, 210, 503
 Epispadias in the female, 479
 Epithelioma of cervix uteri, 245
 Ergotinine, 86
 Erysipelas, facial, treatment of, 460
 Erysipelas of larynx, 596
 Erysipelas of pharynx and larynx, 364
 Erythema multiforme, universal, 229
 Erythromelalgia, 721
 Etiology of glaucoma, 536
 Eucalyptus oils, notes on, 468
 Evans, ganglion and teno-vaginitis tuberculosa, 38
 Exalgine, 338
 Extra-peritoneal nephrectomy for renal tuberculosis, 354
 Extra-uterine pregnancy, 618

FACIAL erysipelas, treatment of, 460
 Fallopian tube, myoma of, 738
 Favus and its treatment, 228
 Fever of growth, so-called, 123
 Fevers, new method in treatment of, 586
 Fibrinous rhinitis, 367
 Fibro-cyst of uterus, 116
 Fibroid tumor, disappearance of, after Apostoli's treatment, 618
 Fisher, lead-poisoning, with especial reference to the spinal cord and peripheral nerve lesions, 51
 Fœtus, extreme maceration of, 615
 Fœtus, general dropsy of, 613
 Folliculous angina, 363

GALL-BLADDER, retention cyst of, 353
 Gall-bladder surgery, 479, 484, 609, 727
 Gangrene following resection of coccyx, 358
 Gangrene of lung, pneumonectomy for, 358
 Gangrene, pulmonary, 720
 Gardiner, immunity from phthisis as affected by altitude in Colorado, 55
 Gastric affections, chronic, 80
 Gastric disorders of phthisis, 382
 Gastric juice, ammonia in, 722
 Gastrorrhaphy for diminishing the size of a dilated stomach, 610
 Gerster, surgical treatment of epilepsy, 503
 Glaucoma, etiology of, 536
 Goitre, enucleation of, 97
 Goitre, malignant, 728
 Gonorrhœa, rectal, 739

Gonorrhœa, ulcerative endocarditis consecutive to, 722
 Gonorrhœal infection in women, 244, 741
 Gonorrhœal rheumatism in children, 374
 Gonorrhœal salpingitis, 247
 Graafian follicle, origin of, 242
 Graves's disease, exalgine in, 216
 Griffith, mid-systolic and late-systolic mitral murmurs, 285
 Gynecological operations, combined, 262

HABERSHON, gastric disorders of phthisis, 382
 Hæmatoma of fold of elbow, 479
 Haffkine's method of protective inoculation against cholera, 583
 Hamburg, cholera in, 593
 Hay asthma, 464
 Head injuries, severe, 222
 Hearing, effects of telephone upon, 110
 Hemorrhage, accidental, 370
 Hemorrhage after amygdalotomy, 622
 Hemorrhages into labyrinth, 108
 Hemorrhagic nephritis, 216
 Hepatic abscess, study of, 125
 Hepatic cirrhosis in children, 597
 Hepatic colic, treatment of, 211
 Hernia, radical cure of, 356
 Hernia, Schwalbe treatment of, 96
 Hernia, strangulated, of ovary, 114
 Herniæ, tuberculous, 221
 Hip disease, reflexes in, 221
 Hip-joint, amputation at, 481
 Hip-joint disease, traction splint in, 481
 Hydatidiform moles, 615
 Hydrargyrum formamidatum in syphilis, 230
 Hydriodic acid in special practice, 466
 Hydrocephalus, chronic, in hereditary syphilis, 624
 Hyoscine poisoning treated by pilocarpine, 340
 Hypophosphite preparations, commercial, 715
 Hysterectomy for fibroid and fibro-cystic tumors of uterus, 246, 498
 Hysterical aphonia cured by compression of ovaries, 235
 Hysterical mania, 546

IDENTITY of bacillus coli communis with bacillus typhi abdominalis, 347
 Impacted cerumen in mastoid process, 101

- Impaired hearing, operative measures for relief of, 102
- Implantation of ureters into rectum, 728
- Incontinence of urine, 374
- Infant feeding, milk for, 494
- Infantile diarrhœa, 82
- Infantile eczema, 374
- Inferior maxilla, restoration of, 485
- Influenza, 218, 362
- Influenza, epidemic, rectal antiseptic injections in, 214
- Influenza, microbe of, 349
- Insanity after Keeley cure, 459
- Insanity caused by inhalation of sulphuretted hydrogen, 597
- Intestinal occlusion, 357
- Intestinal occlusion by torsion of large bowel, 100
- Intra-mammary abscesses, treatment of, 96
- Intra-uterine fractures, etiology of, 614
- Intussusception associated with cancer, 343
- Intussusception of cæcum, 280
- Itching, etiology of, 233
- JOHNSTON**, treatment of acute dysentery by antiseptic rectal irrigation, 157
- KEELEY** cure, insanity after, 459
- Keratosis of larynx, 493
- Kidneys in eclampsia, 239
- Knapp, traumatic nervous affections, 629
- Knee-joint, loose body in, 225
- Kola-nut, 465
- Kola, therapeutic action of, 211
- LAPLACE**, relation of microörganisms to the diseased endometrium, 438
- Laryngeal forceps, 493
- Laryngitis, 493
- Larynx, adenoma of, 622
- Larynx, carcinoma of, 365, 623
- Larynx-croup, etiology of primary, 624
- Larynx, keratosis of, 493
- Larynx, morbid growths of, 622
- Larynx, primary erysipelas of, 596
- Larynx, spasm of, 492
- Larynx, tuberculosis of, 360, 361, 493
- Lead-poisoning, 51
- Leukæmia, 515
- Leukæmia after traumatism, 595
- Leukæmia and diabetes, 477
- Leukæmia, etiology of, 478
- Lewis, seasonal relations of chorea and rheumatism, 251
- Lichen scrofulosorum, 230
- Light as a therapeutic agent, 467
- Lipoma and fibroma of Fallopian tube, 119
- Liver in eclampsia, 240
- Liver, resection of, 352
- Lumbricoid worms, transmission of, 372
- Lupus vulgaris, cod-liver oil and iodoform in, 227, 228
- Luxations of femur in coxalgia, 356
- Lymphangioma, 227
- MADURA** foot of India, 599
- Malarial fever, methylene-blue in, 214
- Male fern, toxicology of, 592
- Malignant neoplasms, inoperable, 87
- Mammary abscess in newborn infant, 120
- Mammary cancer, relapsed, 342
- Mammary fistula, 613
- Mania, hysterical, 546
- Mastoid, opening of, through external auditory canal, 103
- Maxillæ, superior and inferior, resections of, 726
- Maxillary sinus, abscess of, 236, 362, 621
- Measles, bacillus of, 248, 376
- Membrana tympani, osseous new-growth in, 108
- Menstruation, tubal, 498
- Menthol, action of, 712
- Mercury sozoidol, 590
- Metal-turners' paralysis, 61
- Microbe of influenza, 349
- Micrococci in pus of pyosalpinx, 244
- Micrococcus exanthematicus, 596
- Microörganism of typhus fever, 596
- Microörganisms, endometrial, 438
- Microörganisms in the healing umbilical cord, 124
- Middle ear, chronic suppuration of, 490, 730
- Middle ear, operative exposure of, 731
- Milk for infant feeding, 494
- Milk, sterilization of, 375
- Mitral murmurs, systolic, 285
- Mixed tumors, 494
- Molluscum contagiosum, 231
- Monochloride of phenol, 714
- Morphæa with maculæ atrophicæ, 551
- Mucous nasal polypi in children, 363
- Müller's ducts, rudimentary development of, 620
- Mumps, hypersecretion of saliva after, 746

Murray, radical cure of psoas abscess, 35
 Mycosis fungoides, 231
 Myxœdema, treatment of, 588
 Myxoma of sphenoidal sinus, 621

NASAL passages, morbid growths of, 364
 Nasal septum, deflection of, 368
 Nasal tuberculosis, 236
 Necrotic and carious bone, removal of, 483
 Negro, chorea in, 626
 Nephritis, acute, following eczema, 123
 Nervous affections, traumatic, 629
 Newborn child, hæmoglobin in blood of, 733
 Newmark, scleroderma with unilateral facial muscular atrophy, 294
 Nose and throat, trichloracetic acid in, 235
 Nutrition, therapeutics of, 300
 Nystagmus in aural affections, 102
 Nystagmus or clonic spasm of vocal bands, 366

OBSTETRIC antisepsis, 241
 Occlusion of posterior nares, 494
 Edema, pulmonary, in course of croupous pneumonia, 722
 Œsophagotomy, case of, 220
 Œsophagus, foreign bodies in, 361
 Oliver, leukæmia which terminated fatally by retro-peritoneal hemorrhage, 515
 Origin and seat of epileptic disturbance, 471
 Orthopnœa, absence of, in cardiac dilatation of right side, 345
 Osteitis deformans, 474
 Osteo-arthritic tuberculosis, 358
 Osteo-arthropathie pneumique of Marie, 121
 Otitic abscesses of brain, 488
 Otitis media, acute, 106
 Otitis media, cerebral complications of, 489
 Otological Section, American Medical Association, 491
 Ovariectomy during pregnancy, 615
 Ovary, strangulated hernia of, 114
 Ovum, internal crossing of, 499
 Oxychinaseptol or diaphtherin, 337

PAGET'S disease, 474
 Pambatanos, 465
 Paralysis, metal-turners', 61
 Paralysis of posterior crico-arytenoid muscles, 365

Paralysis of recurrent laryngeal nerves, 365
 Paralysis, traumatic hysterical, 63
 Park, suture of patella after fracture, 681
 Parvin, molar pregnancy, 412
 Patella, suture of, after fracture, 681
 Peliosis rheumatica, 745
 Perforation of after-coming head, 495
 Peritoneal adhesions, formation of, 619
 Peritonitic adhesions, influence of, on par-turition, 117
 Peritonitis, general purulent, 726
 Perityphlitis, treatment of, 460
 Pertussis, treatment of, 502
 Phenic acid, acute poisoning by, 212
 Phenocoll hydrochloride, 210, 339
 Phthisis as affected by altitude, 55
 Phthisis, gastric disorders of, 382
 Phthisis, pulmonary, treatment of, 714
 Phthisis, urine in, 473
 Pilocarpine in skin diseases, 228
 Pineal gland, tumor of, 601
 Pleurisy and pneumonia, blisters and blood-letting in, 587
 Pleurisy and thoracentesis, 487
 Pleurisy, treatment of, 84, 214, 340, 462
 Plica, case of, 700
 Pneumococci in pus from a pyosalpinx, 114
 Pneumonia and abscess of fixation, 342
 Pneumonia, treatment of, 84, 462
 Pneumonias of diabetics, treatment of, 715
 Poisoning by water of Javal, 468
 Pons, tumor of, 509
 Porter, physiological importance of the proximate principles and their practical utility in the food-stuffs and in the nutritive processes of the system, 300
 Post-paroxysmal albuminuria of epileptics, 348
 Posture and its indications, 463
 Pott's fracture at the ankle, 611
 Powers, the question of early high amputation in senile gangrene, 562
 Pregnancy, abdominal, 496
 Pregnancy and ventro-fixation, 117
 Pregnancy complicated by nephritis and internal hemorrhage, 369
 Pregnancy, ectopic, 735
 Pregnancy, disorders of teeth during, 371
 Pregnancy, menthol in vomiting of, 712
 Pregnancy, molar, 412
 Pregnancy, obstinate vomiting during, 612
 Pregnancy, ovariectomy during, 615
 Pregnant women, nephritis in, 240
 Primary splenomegalia, 477

Prince, traumatic hysterical paralysis, 63
 Prolapsus, etiology of, 739
 Psoas abscess, radical cure of, 35
 Psoriasis and pelvic abscess, drainage in, 725
 Puerperal eclampsia, study of, 239
 Puerperal hemorrhage, 369
 Puerperal state, death during, 240
 Puerperal tetanus, 113
 Pulmonary disease, inhalation of dust and, 686
 Pulmonary tuberculosis, guaiacol in, 587
 Pyle-phlebitis, suppurative, 723
 Pyoktanin as an antiseptic, 724
 Pyosalpinx, treatment of, 244

QUANTITATIVE determination of red and white blood-corpuscles in health and disease, 602

Quinine rash produced by small doses, 86

RECURRENT facial erysipelas, 365

Renal dropsy, 87

Resection of liver, 352

Resection of rib for cure of empyema, 625

Rest treatment, 335

Retention-cyst of gall-bladder, 353

Retro-peritoneal treatment of stump after supra-pubic amputation, 497

Retro-pharyngeal abscess in infancy, 95

Retro-pharyngeal lymphadenitis, 120

Reviews—

Abbott, Principles of Bacteriology, 73

Adams, Contractions of the Fingers and "Hammer-Toe," 575

Aulde, Pocket Pharmacy, 74

Ballance, Ligation of Arteries, 318

Barr, Treatment of Typhoid Fever, 206

Baruch, Water in Modern Medicine, 580

Beebe, System of Gynecology, 709

Bourneville, Epilepsy, Hysteria, and Idiocy, 578

Burdett, Hospitals and Asylums of the World, 329

Charcot, Diseases of the Nervous System, 202

Cohen, Essentials of Diagnosis, 577

Davenport, Diseases of Women, 709

Debove, Treatment of Empyema, 456

De Schweinitz, Diseases of Eye, 204

Ewart, Cardiac Outlines, 457

Ewart, How to Feel the Pulse and What to Feel in It, 328

Farquharson, Guide to Therapeutics,

74

Reviews—

Goodhart, Common Neuroses, 457

Gowers, Diseases of the Nervous System, 450

Hare, Practical Therapeutics, 67, 324

Hayt, Obstetrics, 705

Herman, First Lines in Midwifery, 705

Herter, Diseases of Nervous System, 450

Hirst, Human Monstrosities, 705

Irwin, Hydrotherapy at Saratoga, 327

Jackson, Diseases of the Skin, 704

Kaviratna, Charaka-Samhita, 576

Kelsey, Stricture of the Rectum, 78

King, Manual of Obstetrics, 705

Lane, Rheumatic Diseases, 327

Leber, Origin of Inflammation, 572

Lovett, Diseases of the Hip-joint, 75

Lusk, Science and Art of Midwifery, 322

Lyman, Practice of Medicine, 570

Magnan, Mental Diseases, 71

Manges, Diseases of the Stomach, 702

Martindale, Coca and Cocaine, 74

Millard, Bright's Disease of the Kidneys, 330

Mitchell, "Characteristics," 707

Ormerod, Diseases of the Nervous System, 334

Page, Practice of Medicine, 453

Prince, Fire Protection of Hospitals for the Insane, 330

Reynolds, Practical Midwifery, 705

Rose, Hare-lip and Cleft Palate, 456

Shakespeare, Cholera in Europe and India, 199

Smith, Treatment of Glaucoma, 207

Stewart, Diseases of the Ear, 69

Sutton, Surgical Diseases of the Ovaries, etc., 709

Swanzy, Diseases of the Eye, 73

Talamon, Appendicitis and Perityphlitis, 456

Thomson, Nervous System, 710

Wells, Treatise on Gynecology, 709

Whitla, Dictionary of Treatment, 77

Rheumatism and chorea, 251

Rhinolith, 621

Rhino-scleroma, 361

Richey, the prime etiological factor of glaucoma is constitutional, 526

Robertson, action of alcohol in the nervous system, 643

Rötheln, 474

Round ligaments, shortening of, 742

Rupture of uterus, 426

- SACHS**, surgical treatment of epilepsy, 503
- Salicylate of soda for sprains, 467
- Saline injections in acute anæmia, 499
- Salipyrine, 79, 464, 465
- Salol in intestines of dogs, 467
- Sarcoma of skin, 226, 230
- Sarcoma of the urethra, 243
- Sarcoma of tonsil, 729
- Sarcoma, primary, of thymus gland, 603
- Sarcomata, multiple, 230, 443
- Sarsaparilla, 468
- Scarlatina, secondary pyrexia in, 249
- Schwalbe, treatment of hernia, 96
- Scleroderma with unilateral facial muscular atrophy, 294
- Scrofula, treatment of, with creasote, 462
- Scurvy, 345
- Sea-sickness, treatment of, 585
- Senile gangrene, high amputation in, 562
- Septum narium, deviations of, 237
- Serous cysts in the cerebellum, 151
- Sharkey, chronic intussusception of cæcum, 280
- Shaw, cortical epilepsy, 691
- Sherwell, multiple sarcomata, 443
- Shock and its treatment, 607
- Shoulder-joint, tubercular disease of, 96
- Skin-grafting, new method of, 229
- Skin disease, epidemic of, 233
- Skin diseases, tumenol in, 232
- Skull, compound fracture of, 99
- Solanine, 210
- Somnambulism and hysteria, 348
- Spasm of larynx, 492
- Spinal column, gunshot wounds of, 98
- Spinal cord lesions, diagnosis of, 15
- Spinal injuries, reflexes in, 602
- Spine, fracture of, 727
- Spleen, in young children, 87
- Spleen, rupture of, in ague, 599
- Splenomegalia, primary, 477
- Staphylococæmia primitiva, 460
- Starr, local anæsthesia as a guide in the diagnosis of lesions of the lower spinal cord, 15
- Stelwagon, a case of plica, 700
- Sterilization of milk, 375
- Sternberg, practical results of bacteriological researches, 1
- Stewart, treatment of sacculated aortic aneurism by electrolysis through introduced wire, 422
- Stomach, diseases of, 461
- Stomach, in young children, 371
- Stomach in young children, resorptive power of, 745
- Streptococcus in blood in scarlatina, 475
- Surgical cases, aseptic and septic, 604
- Surgical gangrene, 359
- Surgical operations upon biliary ducts, 359
- Surgical treatment of epilepsy, 503
- Symphysiotomy, 495
- Syphilidiform erythema, 226
- Syphilis and hypertrophic osteo-arthritis, 602
- Syphilis, cerebral, 470
- Syphilis, treatment of, 227, 717
- Syphilis of lingual tonsil, 587
- Syphilitic tabes, precocious, 347
- Syringomyelia, unilateral, 476
- Systematic antiseptis, 224
- Systolic bruit of fontanelle, 122
- Systolic mitral murmurs, 285
- TABES** and hysteria, association of, 350
- Tabes dorsalis, suspension in, 463
- Telephone, effects of the, upon hearing, 110
- Teno-vaginitis tuberculosa, 38
- Tetanus cured by the antitoxine, 341
- Tetanus, treatment of, 213
- Therapeutic papers, 215, 470, 471, 592, 718
- Therapeutics of nutrition, 300
- Thiophen, 79
- Thrombus of inferior vena cava, 345
- Thyreotomy in an infant, 234
- Thyroidectomy, 234
- Thyroid gland, function of, 223
- Thyroid-juice, intra-venous injection of, 336
- Thyroiditis, 234
- Tongue, tumors of, 377
- Tonsil, tumors of, 238
- Tonsils and palatine folds, disease of, 621
- Tonsillitis, acute, treatment of, 470
- Torticollis due to hæmatoma of sternomastoid muscle, 221
- Trachea, compression of, 366
- Transformation of smallpox into cowpox, 598
- Traumatic hysterical paralysis, 63
- Tropa-cocaine as a local anæsthetic, 591
- Tubal gestation in both tubes, 736
- Tubal menstruation, 498
- Tubal pregnancy, treatment of, 241
- Tubercular disease of shoulder-joint, 96, 725
- Tubercular retro-pharyngeal abscess, 628
- Tuberculoma of cerebral peduncles, 719
- Tuberculosis, bone and joint, 84

- Tuberculosis, nasal, 236
 Tuberculosis of larynx, 360, 361, 493
 Tuberculosis, treatment of, 83, 212, 461
 Tuberculosis, unusual case of, 565
 Tuberculosis, retro-peritoneal, 695
 Tuberculous herniæ, 221
 Tuberculous pachymeningitis, 218
 Tubo-ovarian cysts, 739
 Tumor of pineal gland, 601
 Tumor of pons, 509
 Tumors, fibroid, hysterectomy for, 498
 Tumors, mixed, 494
 Tumors of bladder in children, 250
 Tumors of tonsil, 238
 Twin ectopic gestation, 368
 Tympanic cavity, removal of foreign body from, 731
 Typhoid fever, treatment of, 82, 459, 586
 Typhus-fever patients, bacillus in blood of, 347
- U**MBILICAL infection in infants, 238
 Unilateral syringomyelia, 476
 Ureter, accessory, operation for, 243
 Ureteral fistula, treatment of, 619
 Urethra, development of, in human female, 243
 Urethra, sarcoma of, 243
 Urethritis, acute, 481
 Uric-acid condition, treatment of, 469
 Urine, elimination of creasote by, 466
 Urine, incontinence of, 374
 Urine in phthisis, 473
 Urine, sulphuric ethers in, 464
 Urine, variety of sugar in, 215
 Uterine fibroids, curetting in, 245
 Uterine fibro-myomata, 498
 Uterine hemorrhage, 619
 Uterine mole complicated by hemorrhage, 111
 Uterine mole, treatment of, 112
 Uterine segment, lower, 616
 Uterus, carcinoma and fibro-myoma of, 497
 Uterus, death from retroflexed and incarcerated, 112
 Uterus, fibro-cyst of, 116
 Uterus, partial non-development of, 618
 Uterus, resection of, 739
 Uterus, rupture of, 496
 Uterus, ventro-fixation of, 616
- V**AGINAL hysterectomy for carcinoma, 118
 Van de Warker, hysterical mania, 546
 Varicose veins of leg, treatment of, 222
 Variola, varioloid, and varicella, 373
 Vaughan, bacteriological study of drinking-water, 167
 Vermiform appendix, associated streptococcus infection of, 119
 Vermiform appendix, 101
 Vesico-vaginal fistulæ, closure of, 246
 Virulence of bacillus coli communis, 348
 Voice, impairment of, 237
 Voice, influence of pelvic diseases on, 117
 Vomiting during pregnancy, 612
 Vomiting, treatment of, 585
- W**ALTON, metal-turners' paralysis, 61
 Warren, enlarged accessory thyroid gland at base of tongue, 377
 Water, filtered or boiled, 584
 Williamson, serous cysts in cerebellum, 151
 Wound treatment, antiseptic, 606

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Containing sufficient Tablets of each kind to last from one to three months, according to the condition of the patient.

A Connecticut physician writes:

"I am now using your Tablets on a patient (young lady) who had had three quite severe hemorrhages the week previous to the beginning of the same. She has taken one box only, has had no return of the hemorrhage, and has gained four (4) pounds since beginning treatment, besides all rational symptoms have improved wonderfully. I will add that I had tried Ol. Morr., Syr. Hypophos. Co., etc., with no apparent benefit."

A Virginia physician writes:

"Enclosed find Postal Note for another double box Freligh's Tablets. I used the sample box in three cases, with decided benefit in one, slight improvement in second, and while they did not improve the third case, it being in very advanced stage, there was an amelioration of the distressing symptoms."

A Massachusetts physician, in practice 25 years, writes:

"Send me two double boxes Freligh's Tablets. I have tried the sample box with most excellent results."

A Michigan physician writes:

"I am more than pleased with them. They have not disappointed me once. Dr. C., for whom I ordered a box, writes me that he is much improved, and speaks in praise of them. He has genuine Tuberculosis, and while I do not think he can recover, yet I firmly believe the Tablets will prolong his life."

SPECIAL OFFER.

While the above formulæ have been in use, in private practice, over 30 years, and we could give testimonials from well-known clergymen, lawyers and business men, we prefer to leave them to the unbiased judgment of the profession with the following offer: On receipt of 50 cents, and card, letter-head, billhead, or other proof that the applicant is a physician in active practice, we will send, delivered, charges prepaid, one of the regular (double) boxes (retail price, Three Dollars), containing sufficient of each kind of Tablets to test them three months (in the majority of cases) in some one case. Card, letter-head, or some proof that the applicant is a physician in active practice, MUST accompany each application. Pamphlet, with full particulars, price list, etc., on request.

A PHOSPHORIZED CEREBRO-SPINANT.

(FRELIGH'S TONIC.)

Our Special Offer is still open, to send to any physician, on receipt of 25 cents, and his card, or letter-head, half a dozen samples, delivered, charges prepaid. Each sample is sufficient to test for a week in one case.

As we furnish no samples through the trade, wholesale or retail, for samples, directions, price lists, etc., address

I. O. WOODRUFF & CO.

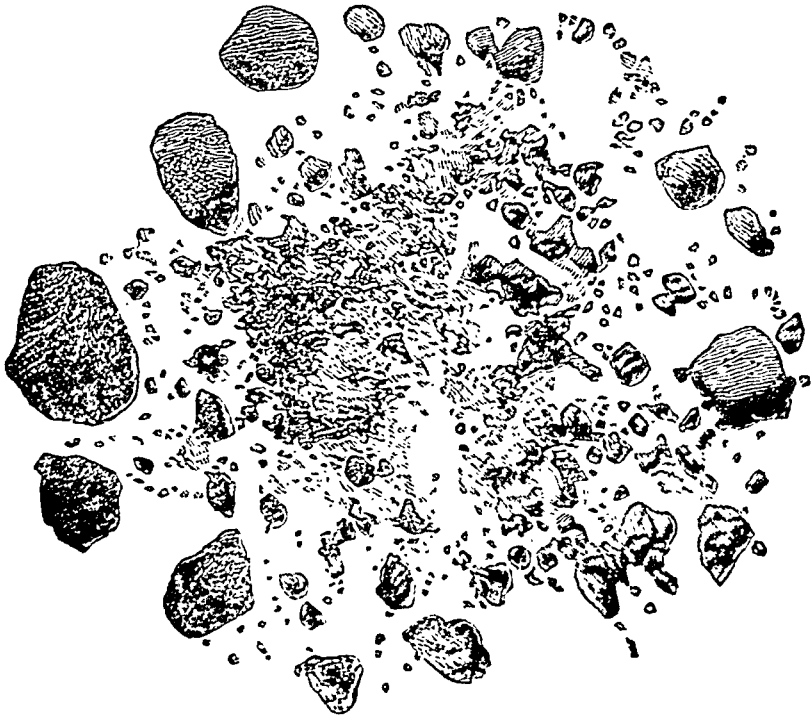
MANUFACTURERS OF PHYSICIANS' SPECIALTIES

88 MAIDEN LANE

STONE IN THE BLADDER.

By J. J. MAXFIELD, M. D.

A year ago Mr. A., fifty-one years old, consulted me for an old-standing and intractable cystitis, as he supposed and had been informed by two physicians. I suggested an exploration and readily detected a stone. It was a large one, and it was so hard that you could hear the click of the instrument in any part of my office. I advised that he should have an operation performed, but as his brother had died



after same operation a few years previously, he was afraid and refused to consent. In view to palliate, I ordered him to drink one quart of Buffalo Lithia Water every day. Washing out the bladder once a day with the same, warm, a careful attention to diet and bowels, with this treatment was faithfully kept up for nine months, the urine and the operation could no longer be

delayed. During the time he was under the treatment, large quantities of débris came away, some of the pieces were so large that it was only by great effort that they were passed via urethra. None of these were saved. The day before the operation, on the twentieth day of June, I examined him again, and the stone did not seem so large nor was the click so pronounced, though we could tell that there was a stone present by the grating as from a rough body. On the twenty-first, I did the left lateral operation, and after getting into the bladder, I introduced the forceps, grasped the stone and pulling it away I found it was like a mass of putty filled with sand. It was sacculated and there was a quantity of pus in the viscus. With forceps, gouge, curette and fingers I finally got it all away. No part of it was so hard but that it could not be crushed with very little effort between the fingers. After the fragments were allowed to dry they became hard.

The cut will illustrate better than I could tell how some of the mass looked, though a great deal of the finest particles were lost in the irrigation.

It will be noticed that there were very few large pieces, and these were so soft that they would drop to pieces on the slightest provocation. This friable quality showed me *why* I did not get so pronounced a sound at my second examination, nine months after the first. Had I known before I operated what I knew afterward, I would not have done it, but with a lithotrite I would have crushed it and washed it out, though I believe firmly that if I had continued the treatment of the Buffalo Lithia Water a few weeks more the stone would have fallen to pieces. The outer segments were roughened, showing the disintegrating action of the water in dissolving it. I believe the case is unique in every particular and shows the value of Buffalo Lithia Water so clearly that I thought it worth reporting. The patient made a complete recovery without an accident to mar it. The total weight of the pieces saved was 213 grains.—*The Prescription.*

Other Clinical Reports and Descriptive Pamphlet sent free.

Thomas F. Goode, Proprietor

THE PUREST AND MOST ACTIVE PEPSIN
EVER INTRODUCED.

WEBBER-PEPSIN

S. & D.

STANDARD 1 TO 6000.

*A SOLUBLE, NON-HYGROSCOPIC, INODOROUS, PERMA-
NENT PEPSIN.*

Dose: $\frac{1}{8}$ to 2 Grains.

The Webber-Pepsin will completely digest 6000 times its weight of coagulated egg-albumen in accordance with the conditions of the U. S. P. test or that of the National Formulary.

It is not a Peptone-Pepsin yet it is perfectly soluble, being free from mucus and inert putrescible matter, and is so palatable that the most fastidious patient will take it readily.

It is entirely free from septic contaminations, or other products of decomposition.

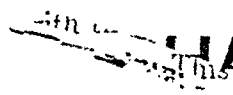
Physicians will appreciate these several advantages as possessed solely by the Webber-Pepsin.

Although further investigations based upon the Webber process have enabled us to produce Pepsin capable of digesting from 20,000 to 30,000 times its weight of coagulated egg-albumen, we have adopted 1 to 6000 as our standard for the Webber-Pepsin because this already far exceeds the digestive power of any other Pepsin yet introduced, and especially because the production of a Pepsin of a still higher digestive power disproportionately increases its cost.

The Webber-Pepsin is offered in Granular form and in Scales, but unless otherwise specified, we invariably furnish the GRANULAR form.

Samples furnished upon application.

MANUFACTURED ONLY BY

 **HARP & DOHME,**

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